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ORIGINAL COMMUNICATIONS.

Relative Merits of the Ayrshire Breed of Cows. By H. [For the New-York Farmer and American Gardener's Magazine.]

Mr. Editor,—The extract from the Quebec Mercury, at page 210 of your last number, contains some valuable information, though not quite new, as most of it may be found in Mr. Aiton's useful though partial work on Ayrshire cows and Clydesdale horses. Sinclair is a laborious man, some of whose statistical works may be useful, but his Code of Agriculture is a mere compilation, like the Complete Grazier, and many other works of that kind, which contain so much chaff and so little grain as not to repay the trouble of reading them. Sinclair begins by saying that the Ayrshire cows are superior to all others in Britain, or in Europe, an assertion more easily made than supported. There are excellent cows in many parts of the continent of Europe, as in the valley of Gruyere in Switzerland, which are described by Simond as yielding for the first three months 24 English quarts per day; for the next three, 12 quarts; and for the next three, 6 quarts; then three months dry. This comes to about 1000 gallons per year, which is the quantity *said* to be given by good Ayrshires. There are good cows in Holland, both for milk and butter, of the short-horn family. The cows of Alderney, Guernsey, and Normandy, are extraordinary for butter, though defective in shape.

In Sinclair's answer to the first query, he says, "The Durham or Teeswater breed are superior as dairy cows to any other breed in England, and if they were as well fed and treated as the Scotch dairy stock, they would equal them in beauty and good qualities." This is pretty well. The Durhams are good milking and grazing stock on rich lands; the Ayrshires derive their good qualities from them, and are good milking and grazing stock on inferior lands. Both are short-horns, but the first have had no Mr. Aiton to puff them, nor do they need puffing. A just and fair account of both kinds is given in a cheap work, the British Farmer's Series, published by the "Society for the Promotion of Useful Knowledge."

No one who knows what the Ayrshire cattle are, will say they are any thing but good stock; still, all overstatements are injurious. A few sentences from the Farmer's Series will put the matter in a fair light. "Some of the Ayrshire cows have been tried in the London dairies. As mere milkers they could not compete with the long established metropolitan dairy cow, the short-horn. They yielded as much milk, in proportion to their size and their food, but not in proportion to the room they occupied, and the increased trouble which they gave, from being more numerous, in order to supply the requisite quantity of milk." [p. 134.] "There is a lurking tendency to fatten about them, which good pasture will bring to light; so that when the Ayrshire cow is sent to England, she loses her superiority as a milker, and begins to accumulate flesh."

It is useless to exaggerate the qualities of any cattle, and it cannot be denied that even in this tendency to fatten when their milk begins to fail, or which often causes it to fail, the Ayrshires must yield to their forefathers the Highlanders, and also to their neighbors the Galloways, when put on a poor soil; and they will be left considerably behind their short-horn sires, when transplanted to luxuriant pasture." The milking short-horn cow, from Yorkshire, which is kept by the milk-sellers round London, is figured and described at page 244: "The quantity of milk given by some of these cows is very great. It is by no means uncommon for them, in the beginning of the summer, to yield 30 quarts a day: there are rare instances of their having given 36 quarts; but the average measure may be estimated at 22 or 24 quarts." When dry they fatten rapidly.

About 12,000 of these cows are kept for the supply of London. In Lizar's British Animals, published at Edinburgh, 1829, and devoted chiefly to Scotch cattle, is a portrait of an aged Teeswater cow, belonging to Mr. Johnston, of Niddry, Mains, which, notwithstanding her age, yielded regularly 21 pints of milk per day, Scots measure, for four seasons during the summer months, and her milk was of the richest quality. This is 42 quarts common measure per day, and is certainly a most extraordinary produce. In the same plate is a portrait of a Fife cow, belonging to Mr. R. Russel, farmer, Balfarg, who says that Mr. Anderson, of Rothes, keeps a dairy of thirty cows, and has tried different breeds, especially the Ayrshire, which is so much in vogue for milk and butter. But he found that they did not excel in this respect, and were much inferior to the Fife cattle in weight when fat. Then follow the portraits of two first rate Ayrshire cows, each of which, for three months after calving, yielded seven gallons of milk per day. These cows gained the first and second premiums at the Glasgow cattle show, September, 1828. In the next number is an account and portrait of a most extraordinary cow, a small West Highlander, which would not weigh when fat more than 460 pounds, and which cost the owner, Mr. Watson, of Cairntows near Edinburgh, £5 at Falkirk Tryst, in 1826. This little cow produced, from 18th April, 1829, to 30th January, 1830, no less than 374¼ lbs. of butter, of 16 ounces to the pound. In the Highland Society's Transactions, vol. viii. p. 258, in a detailed account of the produce of twelve cows kept by Mr. Brown, of Tarbrax, is this passage, "One of his cows marked A, a handsome cow of the Ayrshire breed, and which calved about the 15th of May, 1830, gave during the separate trial, 84 quarts of milk during the week, producing only 3½ pounds of butter, or 1 pound of butter from 24 quarts of milk. Another cow, marked L, the produce of a Berwickshire cow, by a Teeswater bull, and which calved a month before the other, produced during the week of trial, 128 quarts of milk, and 8½ lbs. of butter, being 1 lb. of butter from every 15 quarts of milk. A was three years old, had then her first calf, and weighed about 27 stone. L is five years old, nearly white, and weighed 26 stone. In this case Mr. Brown prefers breeding from A, because she is handsome, and the stock '*will take the market*,' unless the future stock of L shall prove of a more attractive description than her offspring has hitherto done."

At page 210 of the last number of the New-York Farmer, the answer of Sir J. Sinclair to Query 5 is not very precise. The answer to Query 6 gives us the old story of Mr. Crampe's cow, &c. and afterwards by an absurd calculation, and not as a matter of fact, gives the average return of Ayrshire cows, when of good quality, in right condition, and properly fed, as 375 lbs. of butter per cow, yearly. Was there ever a dairy in Scotland which yielded thus? In some counties in England, 160 lbs. is a good average yield; in others, having richer land and larger cows, 200 lbs. is common; but 300 lbs. no one ever heard of except as individual cases. In Orange county, N. Y., 160 lbs. per cow is a good yield, but of 375 lbs. no dairy has ever yet had any experience.

Thus the Ayrshires, though excellent cattle, give less milk than the northern dairy short-horns; and as to butter, there are Fife and Highland cattle fully equal to them, and some superior. As butter cows, in England many are superior, as the long-horns, round Leicester, half-horned cattle, in Bedford, Buckingham, and the vale of Berks, and in the South Devons and Alderneys.

As to horses, Mr. Aiton says positively that Lanark horses are superior to all others. Mr. Gordon speaks in rather more qualified terms. They are without doubt a capital breed of horses, but there are many in the world as good. This variety was formed by putting English Midland county cart-horses to Scotch mares, and then by selection. They are greatly inferior to the best English cart-horses in weight and symmetry, but are strong and true draft-horses, and as fast walkers as can any where be seen. The best place to see English cart-horses in perfection is London, and the best place to see Clydesdale horses is Glasgow. Prime draught-horses in London may ave.

rage £70, in Glasgow £45, and this shows their relative values as nearly as may be. The Clydesdale horses are generally plain-headed; many have lop-ears, short awkward looking necks, and are low in the back. More black horses are seen than of any other color amongst them, but frequently of a bad rusty black, which may come from their great granddams. Some greys and bays are seen. They show no affinity to the Cleveland bays referred to by Mr. Gordon, which are large showy horses, but light carcased and leggy, two great faults. From Cleveland mares and well bred horses are raised many coach-horses, much more fit for show than for use. H.

Salting Flowers. By A. W. [For the New-York Farmer and American Gardener's Magazine.]

It is asserted by a distinguished writer of great antiquity, that "he may conquer all things who mingles the useful with the sweet." It may not be generally known, that common salt applied to flowers will preserve them with nearly all their peculiar odor undiminished for several years.

Roses and other flowers, and aromatic plants, may be picked and salted, and kept in that state until a convenient time for distilling, or until enough are gathered to make it an object.

By this method the season does not hurry the manufacture. Vegetables may be distilled in New-York which were gathered in France or Italy, or even in Asia; and the perfumed water or the essential oil will be in nearly as great perfection, both as to quantity and odor, as if the leaves or plants were fresh gathered.

The salting may be performed thus: Take one and a half pound of rose leaves, or whatever other vegetable substance you choose, add half a pound of salt, and rub them together about four minutes. The friction produced by the salt forcing out the juice of the flower, will reduce the whole to an aromatic paste, which must be carefully collected and kept in a tight vessel in a cool place till wanted for distillation.

When to be distilled, place the paste in the still or retort, with twice its weight of water.

I noticed in New-York, in March last, at a public sale, by Austin, Wilmerding & Co., of drugs and dye stuffs, a large quantity of articles connected with the line of perfumery, such as rose water, cassia buds, myrrh, frankincense, &c., imported from Europe and Asia, and among them two large packages dried rose leaves; although every other article went readily and at fair prices, yet the rose leaves could not obtain a bid, though some of the first perfumers in the United States were present. Now, had these been preserved in salt, and their value known, they would have commanded a readier sale than any other article offered.

Perfumers, by collecting the leaves of roses, wall flowers, lavender, sweet brier, &c., and packing them with layers of salt, in a tight covered jar, or other suitable vessel, sprinkling with each layer a little powder of cloves and cinnamon in equal parts, may acquire a delightful and refreshing perfume, which will last for years with very little waste, which waste may be supplied by adding fresh leaves on the return of the flowering season.

In the New-York Farmer, vol. v., first series, page 265, I gave an article on the making poperee, or a substitute for fresh flowers, in which it is recommended to dry the leaves and sprinkle them with saltpetre. Many pots, put up at that time, still retain nearly their original fragrance; but I have since found that green leaves and common salt is preferable.

Nothing on earth can more regale the senses than a beautiful and large display of roses and other ornamental flowers. But this has been hitherto considered as a luxury which could only be enjoyed by the rich, who wholly disregard profit. But if the most brilliant productions of Flora's kingdom can be rendered equally an object of profit as of pleasure, who would not have a flower garden? Every family, almost, can be furnished with a cheap apparatus for distilling, and may thus render pleasure and profit mutual auxiliaries to each other.

A friend of mine has a plan which he thinks an important improvement in distilling essential oils, by the pneumatic apparatus used for making gases, which he will shortly make the subject of a separate communication for your valuable Gardener's Magazine.

Lansingburgh, 4th August, 1834.

Visit to Long Island. By the EDITOR.

[Continued from page 229.]

Leached ashes are very generally used on the Island for manure. They are principally obtained from this city. For all soils, except clayey and wet, they are very durable, exhibiting their good effects for six to ten years. In connection with yard or street manure, they are usually applied to the wheat crop, which, at the rate of twenty bushels per acre, pays for the whole expense of manuring, leaving the future crops to produce the profits. We have the authority of Judge Rolph to say, that the father of the Editor of this publication was the first to introduce them from abroad into Huntington, and that he himself immediately afterwards began to buy them from clam-boats from Connecticut, which brought them across the Sound as ballast. He gave 12½ cents per bushel, heaping as many as he could on the half bushel. They now sell for 12½ to 16 or 18 cents, struck measure.

The agriculture of Long Island is in an improving condition. The Hon. Silas Wood and Judge Rolph gave it as their opinion, that the agricultural products of the town of Huntington have increased in the last ten years at least 30 per cent., and that this is generally true of the towns in Suffolk county. Mr. Z. B. Oakley, one of the most extensive merchants on the Island, supposes the increase, within the last eighteen years, to have been more than doubled. Many farmers who obtained but two or three loads of English hay, now from the same farms obtain 50 to 100 or more loads. Formerly every farmer depended principally on salt meadows for hay. Most of those living in the middle and on the north side of the Island were compelled to cart it from the south side, where there are extensive meadows, or to unite and send sloops to procure it from the meadows of New-Jersey. Such has been the increase of English or fresh hay, that salt meadows on the south side have greatly depreciated in value.

The use of fish for manure, particularly in the more eastern towns, has made great additions to the crops, particularly of turnips and wheat. Within the last fifteen or twenty years, Southold and Oyster Ponds have probably more than trebled their amount of products.

Long or Nassau Island is 115 miles in length, with a medial breadth of about 10 miles. With the exception of a broken ridge of hills, running principally on the north side of the Island, it may be considered very level. Within 12 or 15 miles from Brooklyn, there is a level tract denominated Hempstead Plains, extending about 15, with a medium breadth of 4 miles. The surface soil consists of a black vegetable mold, which, although covered with a long coarse grass, yet utterly failed in producing crops to the early settlers of the Island. In consequence this whole tract was, until within a very few years, left wholly uninclosed and uncultivated. To him who approached it at night-fall and under a cloudy sky, it was perilous in undertaking to cross it, especially if his imagination was apt to conjure into existence hobgoblins and direful forms. Not then, as now, existed there the unerring turnpike and fence, but only uncertain and cross waggon tracks, leading the lone traveller far from his homeward way. These plains now, principally by the aid of ashes, yield excellent crops of wheat and corn, as well as other products of husbandry.

Journeying on east, through the middle of the Island, we come to the brush-oak plains in Suffolk county. These consists of a level tract, covered with a thick impenetrable scraggy oak about five feet high. These plains abound in deer, which, in the season of hunting, afford rare sport for this section of our country. The soil is light and thin, but probably rests in many places on a more retentive subsoil. We are fully persuaded that burning, with other judicious and experimental resorts, will quicken the soil and make it productive. Much of this land could be bought for a sum not to exceed two or three dollars an acre: a price, in our opinion, offering valuable speculations to enlightened practical agriculturists.

Partly in connection and continuation with the shrub-oak, are extensive tracts of pine plains, very sandy, and covered with heavy pine timber. Much of the pine wood coming to this city is from this portion of the Island. These plains are not as barren as those between Albany and Schenectady, some portions of which are brought into profitable culture.

Independent of the above features, the whole island is inviting, and offers encouragement to an agriculture appropriate to the times and circumstances not surpassed by many portions of our country. Especially is this true when taken in connection with the peculiar advantages of the island—its admirable geographical situation, its oceanic and river boundaries, its numerous bays, harbors, and inlets, and its diversified scenery. The abundance of fish and water-fowl, as well as game, adds greatly to the desirableness of the island as a residence. Hitherto the strong current of emigration to the west has engrossed the entire attention of enterprising agriculturists, and Long-Island, owing to its lying out of the limits of the natural thoroughfares and scenes of active trade, has been greatly neglected. But now, since the extent and wealth of New-York are not only making calls for large supplies of produce from the island, but are annually sending out citizens of taste and property in search of

residences, the improving condition of agriculture is rendering the island more healthy, by removing the local causes of fevers.

The recent rapid increase of the city of Brooklyn, and of most of the villages, has given a much needed stimulus to the whole island. The contemplated railroad from Brooklyn, to near the eastern extremity, has justly magnified the relative importance of this section of our country. Indeed, on the supposition of its being completed, we anticipate the time will come when cottage residences, farms, and perhaps all real estate, will bear a price disproportionately high, according to its real worth, in comparison with most other sections of our country. Nothing will conduce to this end more certainly than an increased attention to an improved agriculture, and to the principles of landscape scenery. A judicious and liberal use of manure, and a taste for rural embellishment, will give to the island pre-eminent attractions. As important auxiliaries to this end, a greater number of superior schools should be a subject of lively interest to every resident. The character of the inhabitants, particularly the eastern parts, being similar to that of the people of Connecticut, to which colony the island formerly belonged, is a pleasing feature. If we can combine the charms of society with those of rural beauties, we are in the enjoyment of the most refined pleasures of life. The former is attainable by education, and the latter, in a high degree, by the islanders, if they will, by industry and taste, fill up the picture the outlines of which the Creator has beautifully drawn.

National Agricultural Society at Washington. By H. PERRINE, United States Consul at Campeche. To the Editor of the New-York Farmer and American Gardener's Magazine.

I avail myself of these first convalescent moments from my nearly fatal attack of colonitis, on the 27th ult., to propose, through your useful periodical, that a National Agricultural Society be formed at Washington, in December next, to be composed of the President, Secretaries, Senators, and Representatives of the United States, and of such other members as may be delegated by the agricultural and horticultural societies of the different States. As General Jackson has officially expressed his favorable opinion of the independent farmers of his country, it may reasonably be hoped that the late independent farmer of Tennessee will consent to serve as the first president of the first agricultural society of the Union, "which must be preserved" principally by our agricultural populations. The cultivators of the soil constitute an immense majority of our citizens, and hence possess both the right and the power to promote the prosperity of themselves and the nation by all the legitimate encouragements of judicious legislation. Even the nullifiers of Carolina will admit that they are entitled, at least, to a revenue protection in the growth of every vegetable adapted to our diversified climate and soil; and it can be demonstrated that if even our twenty-four existing states should not suffice for the cultivation of all the vegetable plants embraced in the twenty-four classes of the Linnean System of Botany, our two peninsular territories will afford a congenial asylum for all the remaining useful vegetables of the world. A multitude of observations support the position "that there is not a square league of earth but what presents some one plant peculiar to itself, or at least which thrives there better, or appears more beautiful than in any other part of the world." On these principles let the American system of agriculture be formed. Instead of imitating Europeans in forcing the production of similar plants in inferior climates and in inferior soils, let us introduce and cultivate the naturally most productive plants for every section of our natural climates and natural soils. The present agricultural distress of the sterile districts of the *old*, or northern and southern, Atlantic States, is principally caused by the cultivation of our common staples in the fertile districts of the *new*, or western and south-western, states; but as sterility is entirely a relative term, the agricultural remedy for this distress is simply the cultivation of such new staples as are equally productive in the most barren soils. The great merit of the plants which I recommend for domestication consists in their yielding the greatest possible product with the least possible labor, on the poorest possible soils! Their introduction is hence an equivalent to adding fertility to our most sandy, stony, and sterile districts, and wealth to our poorest and most feeble population. But what avails my still small voice from a distant country. Even the truths necessary to our eternal salvation require the aid of powerful associations to ensure their effective propagation! How necessary then that an excitement should be created throughout the nation by means of an agricultural society at Washington, to promote the immediate introduction and extensive growth of those hardy exotics, which, in any soil and situation, and with very little care or cultivation, will restore peace and prosperity to the Union. Yours, respectfully,

H. PERRINE.

Consulate U. S. A., Campeche, 7th June, 1834.

Introduction and Growth of Useful Exotic Plants. By MAGNOLIA. [For the New-York Farmer and American Gardener's Magazine.]

[This communication was written for both the New-York Farmer and the Albany Daily Advertiser.]

Among the various traits which form the aggregate of the human character, none else is so truly wonderful as the numerous anomalies and paradoxes it exhibits; which, perhaps, no human skill can account for or reconcile. Among others, to see men toiling, with agonizing efforts, to gratify some peculiar desire; often wearing out life without success, and cursing their cruel fate, when the desired object, in abundance beyond their utmost wishes, lies neglected in open view within their reach.

Who can hesitate to deny that man is a reasoning animal, notwithstanding all his wonderful display of intellect, when he sees him exhausting the wealth of his nation in building ships to circumnavigate the earth to purchase and bring home cargoes of dry leaves? And yet this folly is more than accounted for by the still greater folly of the country at large, who pay for them an advanced price, when the same country would produce the leaves in as great profusion, and with as little labor, as any other. Or, who could be made to believe, if the fact did not stare him in the face, that *man*, who can investigate and expound almost the entire code of Nature's laws—can measure the magnitudes and distances of the sun, moon, and planets—could be so foolish as to wear out his life in toil, to gain possession of a few acres of land, and even that of stinted fertility, when his own country contains almost countless millions of acres, infinitely more productive, and every way of more intrinsic value, which may be had for little more than asking.

More than half a century has passed away since the United States became, nominally, an independent nation; and yet, though our ships are traversing every sea and ocean, in quest of articles of necessity or luxury, a great proportion of which are either partially or wholly of vegetable nature, every one of which would grow and flourish as luxuriantly in our own country as in any other, still, the catalogue of our vegetable productions, with some trifling exceptions, remains the same as fifty years ago. The article of cotton was produced in this country before the revolution; but, owing to the labor of separating it from the seeds, it was of little value any where. But the genius of a single American individual has rendered it not only a chief material in the clothing of all classes of our own country, and the main pillar of our export trade, but of essential importance to the whole world. The sugar cane is a thing of late introduction, but already it exceeds in profits to the grower any other article of American produce. One might naturally suppose this article alone might open a field for the display of emulation, or at least for the gratification of avarice, to an extensive degree. But, though we have vast regions of as fine land as ever bore a plant of sugar cane, where, in dismal solitude, the native foliage seems to sigh responsive to every breeze, as if mourning for want of cultivation—and at a price, too, which is but a mere acknowledgment,—and though thousands are constantly complaining that the hardness of the times affords no opening for enterprise, yet this most inviting subject appears to be as little thought of as emigrating to the moon.

There is not, probably, a plant on earth but will flourish as luxuriantly in some part of the United States as in its native soil. Though wholly within what is commonly but improperly called the temperate zone, we have an extensive territory, embracing every advantage, and yet scarcely any of the disadvantages of the torrid zone. The tropical islands, adjacent to the shores of Asia, are constantly draining large sums from the United States, in return for the rich, spicy, and aromatic produce of their soil and climate. But their unwholesome atmospheres endanger life, even in the short stay necessary in commercial intercourse. And the islands of the West Indies and the tropical parts of South America, both from physical and political causes, are neither pleasant nor healthy. But the southern part of the peninsula of Florida possesses all the advantages of any location between the tropics: situated not only on our own continent, but with singular advantages for intercourse with all the world; the stopping-place, or *half-way house*, in the greatest thoroughfare on the ocean, with an atmosphere seemingly composed of the very quintessence of life, and under our own national government, and consequently a part of our national home.

A great part of our southern frontier contains extensive marshes, which exhale miasmatic effluvia, and are consequently unhealthy, especially to people inured to colder climates. But Florida, from the middle of the Peninsula to the Cape, is sufficiently elevated to give it all the advantages of a dry soil, and from its peculiar situation, washed on both sides by the warm equatorial current, and its atmosphere, partaking of the current of warm air which accompanies that of the water, both theory and observation confirm the belief that, though nominally in the temperate zone, it is more congenial to the growth of equatorial productions than any place within the tropics. Its healthiness is too well established to admit of controversy. Among numerous authorities of unquestionable veracity, one might well consider that of Mr. Dubose, the lighthouse keeper and collector at Cape Florida, of itself satisfactory. He has eleven white persons in his family, besides negroes, not one of whom has been sick in seven years. Mr. Dubose remarks, "I have lived in Florida twelve years, and with respect to health, I can assure you that in no part of the world can be enjoyed more of that blessing." That most indefatigable naturalist and philanthropist, Dr. H. Perrine, American Consul at Campeche, in describing the south of Florida, says, "Cape Florida resembles Matanzas and Campeche in the dryness of its winter and the uniformity of its temperature. The southern part of Florida has also perpetual trade wind—the daily sea, and nightly land breeze, and rainy summer, of the islands of Cuba, Hayti, Jamaica, and Porto Rico; hence it combines all the phenomena of a tropical climate, viz.: a constant ærial current to the west—an alternate land and sea breeze—a delicious dry and refreshing wet season—and a great uniformity of temperature throughout the year. But tropical Florida, as it may now be called, must be blessed with a still greater equality of temperature than the West Indies, or the peninsula of Yucatan. It has not the elevated mountains of the former to chill and change the atmosphere, with thunder, lightning, storm, and rain; it has not even the wide surface of the latter to cool the air so greatly by night, or to heat it as greatly by day." In further confirmation of its fitness for tropical plants, may be added what is a well known fact, that, in the island of Cuba, the Florida oranges bring a higher price than their own on account of their superior size and flavor.

The merciless gripe of lawless oppression in Europe is inundating our country with an overflowing population of laborers, a great proportion of whom are, no doubt, honest and industrious, but are unable to procure subsistence without immediate employment; and as there is not sufficient employment for all, those who cannot procure it must not only be objects of distress to themselves, but of great annoyance to others, constantly tempted to vice, and even to crime. What a field does this state of things open for a few enterprising men of some capital, instead of following the beaten track of emigration to the westward, to enlist a small colony of these laborers, and lead them to the delightful regions of southern Florida, where two days' labor in a week would produce much more wealth than the severest labor for six days would do at the north. Where man, instead of being a slave to his dumb beasts, toiling all summer to support them through the winter, besides several months of the severest toil to procure fuel to keep himself from freezing, can enjoy, through every day of the year, the richest luxuries of nature, with little more trouble than barely the gathering—where, if his fancy or necessity requires articles from other climates, he can always command them in exchange for the rich produce of his own soil. Here, he cannot only, as Dr. Perrine facetiously writes to his friend, (A. Walsh, of Lansingburgh,) exchange oranges for apples, bananas for pears, tamarinds for gooseberries, spondias for plums, guavas for quinces, yams for potatoes, and figs for raspberries; but he can soon increase his list with all the boasted variety of southern Asia.

To the eye of reflection, with a knowledge of the existing relative facts, this subject certainly presents one of the most inexplicable mysteries to be found in the whole compass of nature,—why this most truly enticing portion of the United States, both on the score of pleasure and profit, should thus remain a solitary wilderness, while the overwhelming tide of emigration is forcing its way to a region of much less fertility, and which nearly one half the year is a dreary desert of ice and snow? And why, instead of acclimating and cultivating in our own country every useful plant of foreign growth, we should still persist in importing them at a hundred times the expense which would produce them here?

There is not, perhaps, any article which drains more money from the United States than tea; and there is probably no part of the world where it could be more successfully cultivated than in the middle States. It is true, the introducing both the plant and the knowledge of cultivating and preparing it would be attended with considerable expense, but the expense of importing two cargoes would more than cancel it. It is also true, that the colonization of the southern part of Florida, and the general introduction of foreign tropical plants, would be a work of some time and expense; but if neither is ever began, neither can ever be accomplished.

It is argued by many, that the continued importation of articles of exotic growth is better policy than to introduce and cultivate them at home, as it gives stimulus to enterprize by encouraging foreign commerce. But the same reasoning would apply with equal force to every article produced by industry, whether in agriculture or manufactures. If it is good national policy to continue forever to import our tea from China to encourage commerce, it would be still better to import potatoes, as they would be more bulky, and would drain less money from the country. Our nation has been taxed millions for the benefit of the manufacturing interest, while little or nothing has been done to encourage agriculture, which is the first and greatest source of national wealth.

It would not, probably, be in the power of government to devise any tariff system which would benefit the agricultural interest, and if they could, its policy would be very doubtful; and yet many things may be done which would operate much to its encouragement, without injuring any portion of community, and against which no possible objection could be raised. The appropriation of small portions of land in different latitudes, for displays and experiments in agricultural improvements, especially the introduction and acclimation of exotic plants, subject to proper national inspection, with rewards, also to be paid in land, for particular displays of industry or talent, or both, would produce more benefit than could possibly result from tariffs or any pecuniary reward. A township of land given for that purpose, near the southern extremity of Florida, would serve as a nucleus to a system of improvement which would be of more service to the nation than perhaps fifty times the amount laid out in any other way; and instead of incurring any expense to the nation, it would give immediate value to an integral part of the national property, which is now of no more value than land in the moon. It would soon open a field for the employment of beings who now, for want of employment, are infesting the country like a gathering and putrifying sore; and it would serve to show the advantage of hired labor over that of slaves.

MAGNOLIA.

Cultivation of the Hop. By E. SAYRES.

[For the New-York Farmer, and American Gardener's Magazine.]

Mr. EDITOR,—The following communication is an extract from the Horticultural Compendium, a work I am now preparing for the press, which I think will be ready by the 1st of January next. I shall commit the manuscripts to your opinion and those acquainted with horticulture, before they are put to the press. With the greatest respect, yours,

E. SAYRES.

It is very probable this work may come into the hands of those desirous of cultivating the hop. I therefore think some observations on this branch may be acceptable, and I have the assistance of my father on this subject, who has had much practical experience in Great Britain, he being from the county of Kent in England, where hops are known to thrive better, and are manufactured equally, in regard to their being prepared for different uses, as fine ales, brown stout, porter, dyeing, &c., to any part in the known world. He has had also several years' experience in agriculture in the north-western part of the state of New-York, where he suggests that the hop might be grown to a great advantage, and with economy. I beg to quote from his letter to me on that subject. He says "The hop, so far as I have been able to observe, may be grown not only to a good account, but to good *perfection*, in America, *particularly* in the north-western parts. On spots of good deep land, lying by the windings of streams where the plough cannot conveniently be used in agriculture, adjacent the clearings of coppice wood, where poles might be obtained at very small expense, nearly the whole extent of numbers of acres might be put to that use; the small ones for the first and second years' poling, and the large ones *cut* to 16 or 18 feet, and laid on small logs in piles, with their *small* ends inwards, and covered with the branches of the pine, &c., in order to throw off the *wet*, by which they will become more durable than if used in a green state, especially the pine, if cut in the spring. After the poles have been used several years, they would serve to fence the hop garden, and *then* come to the fire, or make charcoal to dry the hops. Observe: if you would have good samples of hops come to

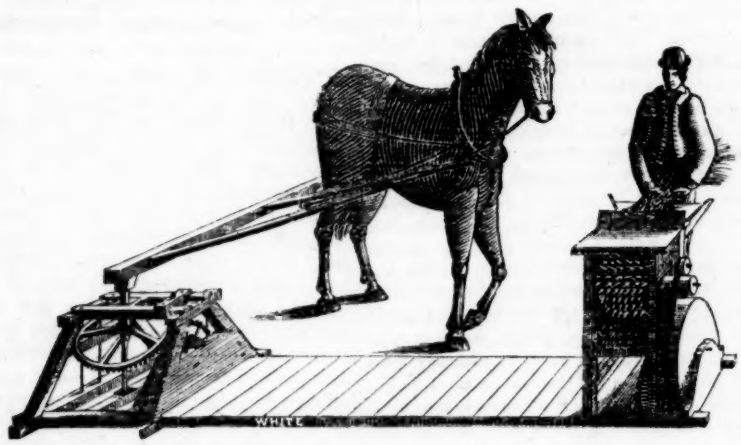
market, which is not generally the case, the planter will require to be careful to select good varieties of plants, and not to intermix those growing wild, which are generally late in ripening, and much more subject to the mould, and often when dried appear of a bad green, while good sorts will produce a bright yellow, and it is seldom that two or more sorts dry well together, as the green varieties will not bear the *fire-heat* until the better varieties have lost their good and fine qualities by hanging too long. If, therefore, a planter is inclined to have more than one sort, he should be careful to plant and pick each sort separately; and it may also be remarked that some sorts of hops require much longer poles than others, so that if intermixed in planting, they would overrun those of a better quality, and weaken them in such a manner that your whole garden would soon be of an ordinary quality. In large plantations, however, it is customary to have two, three, or more varieties, that the process of *picking* may be prolonged, or rather extended to a month or more. The sorts generally preferred in the county of Kent, England, of which place we are natives, are, for early picking, the Farnham, or golden grape; for main crop, the Canterbury white; for late, the Mayfield grape or ruffler. The two last sorts require but short poles, are very hardy, enduring much wet and wind. They dry well and are generally in demand.

Planting the Hops.—In respect to the method of planting, I would prefer the distance of 7 feet from plant to plant each way, so as to give space for a free circulation of air, and to have room to work between the hills, which is a great preventive of mould or mildew, to which this country is much subjected to.

If there should be an opportunity to obtain cuttings in the spring previous to the planting in the intended ground, I would take the advantage of planting them in a rich garden spot 6 inches apart; keep them clean through the summer, whilst I made a fallow of the intended spot; manure it well with good rotten dung, and sow it with turnips, which I would feed off with sheep, or draw a part of them from the ground. But the former I would recommend. The above method I have found in all cases to be an excellent preparation for hops.

One good nursery plant to a hole or hill will be sufficient. Dig out a hole one foot deep, and the same in width; fill the hole with surface earth, or compost of rotten dung and loam; trim off the fibres of the roots so that they may be planted with their roots straight down into the middle of each hill, with a spade or dibble, and close the earth well about the roots with your feet or dibble. The time of planting I would recommend is in the fall, on dry soils, and as early as the ground will work in the spring on loams, &c.

In proceeding on this subject, it will be perceived that I have taken more space than I at first suggested, it being proper to treat of the different subjects to be practised in the management of hops, as their respective varieties, manner of planting, culture, picking, preparations for drying, the manner of drying, &c., all of which have been duly considered and written, or from practice adopted, when in a hop country. E. S.



Flagg's Portable Horse Power Threshing Machine. [Communicated by the Inventor.]

This almost invaluable machine to the farmer is now in successful operation in many of the best grain counties in this State, as well as in other States. These machines have been tested the past year, by a number of our best farmers, who have so good an opinion of them as to give their certificates or recommendations of their utility. Being a portable machine, with horse power complete, it can be moved from barn to barn in a one horse waggon without taking it to pieces; it can be worked in the field or in the barn at pleasure. A barn floor 16 by 31 is of sufficient size for the machine, horse power and all; it can be put in operation in a few minutes in any place; it requires much less power to put it in motion, threshes faster than any other machine of the same size and power, and perfectly clean. It is also more simple in its construction, and not so liable to get out of order. The threshing part can be removed by only slipping off the band, and any other machine put in its place that the farmer may chance to have, a cider mill, a straw cutter, a corn sheller, or a grind-stone, or any similar machine.

For the small sum of one hundred dollars, the farmer can have the portable horse power and threshing machine complete, which embraces every advantage that can be derived from a portable machine.

About forty or fifty of the above machines are now in use in the counties of Dutchess and Columbia, and give perfect satisfaction. The fact is, this machine stands unrivalled by all others now in use, as to ease, speed, simplicity, durability, and cheapness. The inventor bids defiance to all inventors to supersede it.

This machine can be seen at 193 Water street. They are manufactured at Mr. Jacobus', Fulton street, Brooklyn.

David Flagg, jr. Patentee.

Foliaceous Fibres. By H. Perrine, U. S. Consul at Campeche. [For the New-York Farmer and American Gardener's Magazine.]

Mr. Fleet,—I am astonished at the apathy with which the American people read the brief notices of the value of *fibrous leaved* plants for cultivation to yield superior substitutes for the flax and hemp of fibrous barked plants. They are all *perennial profitable products of sandy, stony, or sterile soils, propagated, cultivated,* and *prepared* for market with the *least possible capital, skill, labor, or care.* Is it possible to express greater merits in fewer words: or does the world judge that the value of plants is proportioned to the tediousness of detail in their description or culture? As the fibrous leaved plants seek only mechanical support from the ground, and are nourished entirely by water and by air, they exact very little labor from either the writer or the cultivator; and these brief facts constitute their highest importance for *American agriculture.* Look at the thousand details relative to the propagation and preservation and cultivation of the mulberry and of the vine; and add to them the skill and the care and the time requisite for the preparation of silk and of wine. Note the natural or artificial richness of the soils, and the laborious preparation of the surface required for the sowing of the seed of flax and of hemp; the care and the trouble necessary to gather and preserve the seeds; and the multiplied tiresome labors which follow the ripening of the plants up to the extraction of the fibrous materials of their bark in a condition fit for market. There is the cutting, or pulling and spreading, or drying, and then standing or shocking, in the field, after knocking off all the leaves. Afterwards comes the *un*shocking and *re*spreading for dew-rotting, and the time requisite for this ticklish operation. If the appearance of the lint is sought to be improved, the shocks must be stacked, and remain over a whole year before the plants are exposed to be rotted. If its qualities of strength or duration are attended to, the still more laborious operation of water-rotting must be substituted. If the hemp should not be spoiled in either of these processes, at the end of all this time, then the plants must be again collected together, and put into shocks or stacks, and reserved for clear frosty nights, or dry cold days in February or March, to be broken by the arm breaking flax or hand-brake; and afterwards the thread must be softened by scutching or beating, and separated by hackling or hetchelling. But as all the necessary information occupies nearly six columns of the New-York Farmer, on page 88–9 of the March Number, for 1833, although written by the pen of Henry Clay, that fact alone will convey a repulsive idea of the details requisite for the culture of the hemp.

Contrast then the simplicity and facility of the culture and preparation of the hardy pe-

rennial plants, whose *foliaceous fibres* are superior substitutes for the *cortical fibres* of flax and hemp. The suckers are planted in any soil or situation: the few weedings, which may be useful before their leaves shade the ground, are the only semblances of cultivation during the first two years, while ever afterwards they need no more care or labor than the wild trees of our forests. Even during those first two years those three or four weedings may rather be considered the culture of the corn, or the beans, or the potatoes, or the other annual crops which are raised in the spaces or rows left between the perennial fibrous leaved plants. The leaves may be cut at all hours of the day or night in wet or dry weather, in every month of the year, and may have the fibres prepared the same minute, or the same day, or a week, or a month afterwards, by the easiest possible process of *simple scraping* only.

Any person who can plant cabbages or apple trees in a corn field, or plant corn or potatoes in a young apple orchard, can do more than is requisite to bring a young hemp agave field to maturity, without losing the use of the ground for any annual crops. Any child that can chop a corn stalk can cut off an agave leaf, and can as easily separate its fibres as he can scrape his walking stick; and within half an hour's exposure to the air the sisal hemp is dry enough to be packed for market. Observe how few the words which will communicate the whole details of its culture and preparation for commerce:

"Plant suckers of a yard high, two yards apart, among any annual plants which may be cultivated on the ground during two years. At the end of that time cut all the lowest mature leaves, and continue to cut the remainder as fast as they ripen, from 5 to 15 years, until the plants die; and repeat the same operation on the mature offspring, which shoot up from their roots *forever*. Separate the fibres from the fresh leaves at any moment after cutting, during the month or time they may remain green, by simple scraping only, and let them dry a few minutes in the sun, or shade, previous to packing for exportation." Additional remarks: "If the ground be too poor to cultivate with profit any annual plants, the spaces between the agaves must be weeded, until they themselves gain strength enough to choke all other vegetables. Remove the sucker, which, after the second year, spring from their roots, to form new plantations. Plant a double row all round the field, to form a perpetual hedge for their fellows, whose annual or quarterly clippings will augment the crop of Sisal hemp. At the lowest calculation of two pounds to the plant, every acre of arid sand will yield above a ton, or more than double the highest estimate of the common hemp on the richest loams."

But, as I have before observed, the American agriculturist must not calculate his profits by the gross number of dollars obtained from a single acre of land, but by the net number of dollars obtained from the labor of a single hand. *Now, I am both willing and able to demonstrate, that the cultivator of Sisal hemp in Florida can obtain a hundred per cent. more net profit, per head, than the cultivator of the sugar-cane in Louisiana.*

You well know that all the species of the natural order of Bromeliaceæ, (which would be better christened Agaveaceæ,) can live in a hot dry air alone. I have watched a plant of the Agave sisalana during the last eighteen months, which was pulled up six months before, and thrown alongside of a stone wall on a heap of stones. It is still alive, and putting forth fresh leaves, although not a single fibre of its roots has any connection with the earth. You also know that various species of agave, all botanically baptised with the comprehensive specific name,—Agave Americana,—have run wild in the south of Europe, and are used for hedges as high as Switzerland. You further know that these hedges were so strong and impenetrable, and made so great a resistance to the progress of armies, that pioneers were sent to cut down these live fences on the line of march. Now, is it not shameful that we have not made a single effort to introduce these hardy natives of America into the United States for hedges alone,—especially when we reflect on the fact that a brother species, the Agave virginica, is indigenous to our country as far as the Potomac? Is it not wonderful that the true Pulque agave has not been tried as a superior substitute for the vine? A plant which flourishes on the most arid grounds, and frequently on banks of rocks hardly covered with vegetable earth, which is neither affected by drought nor hail nor excessive cold, and which nevertheless constitutes a true vegetable spring, yielding from one to two gallons of Pulque daily, from four to five months in succession.

If the cultivation of the vine be desirable in the U. S., how infinitely more desirable should be the cultivation of the Pulque agave? I have repeatedly told you that Humboldt was grossly mistaken when he asserted that the leaves of the same plant yielded the fine long strong fibres called Pita, and that they do not even yield the coarse strong short fibres called Sisal hemp. Even a child would have remarked of the pita that the fibres could not be obtained from leaves that were *not half as long*. I have some parcels, nearly twelve feet in length, obtained from long narrow thin dry leaves, which an untutored eye cannot distinguish from those of the pine apple bromelia. But Humboldt was still more inexcusable in asserting that these fibres were obtained from the leaves of the same plant whose stem yields the pulque, when the distinctive epithet of Pulque de Maguey, added by the natives themselves to the drink-producing plant, implied that there existed other species of maguey from which no drink could be obtained. As he furthermore had himself observed, that, "in the Spanish colonies, there are *several species* of maguey, which deserve a careful examination, and of which several, on account of the division of their corolla, the length of their stamina, and the form of their stigmata, appear to belong to a *different genus*," it is inconceivable how he should still venture to give, in his latest edition of equinoctial plants, the Agave americana as the only species in all tropical America! Now, the facts are, that the best Pulque agaves are cultivated for the juice of their stems alone, and do not contain any valuable fibres in their leaves: that the Henequen agaves are cultivated for the fibres of their leaves alone, and do not contain any valuable juice in their stems; and that there are numerous varieties of both species which preserve their respective characteristics of being valuable, either for the juices of their stems or the fibres of their leaves alone. In speaking of the difficulty of distinguishing botanically the poisonous from the sweet species of cassave, Humboldt himself observes that "it is with the cultivated jatropha as with the sweet orange tree, which botanists cannot distinguish from the bitter orange tree, but which however is a primitive species, equally propagated from the grain. Even the natives themselves cannot distinguish the sweet from the poisonous species of cassave by the appearance of the stalk, or leaves, and hence decide by the taste of the roots themselves.

It is hence not wonderful that the different species of agave cannot readily be described by the minute differences in the external characters of the leaves, and as for the flowers of the stems, which only appear in five to twenty years, even in their native fields, and are immediately cut down by their superstitious cultivator, from the apprehension that they will damage the other plants, they can be rarely seen together by a civilized inquirer.

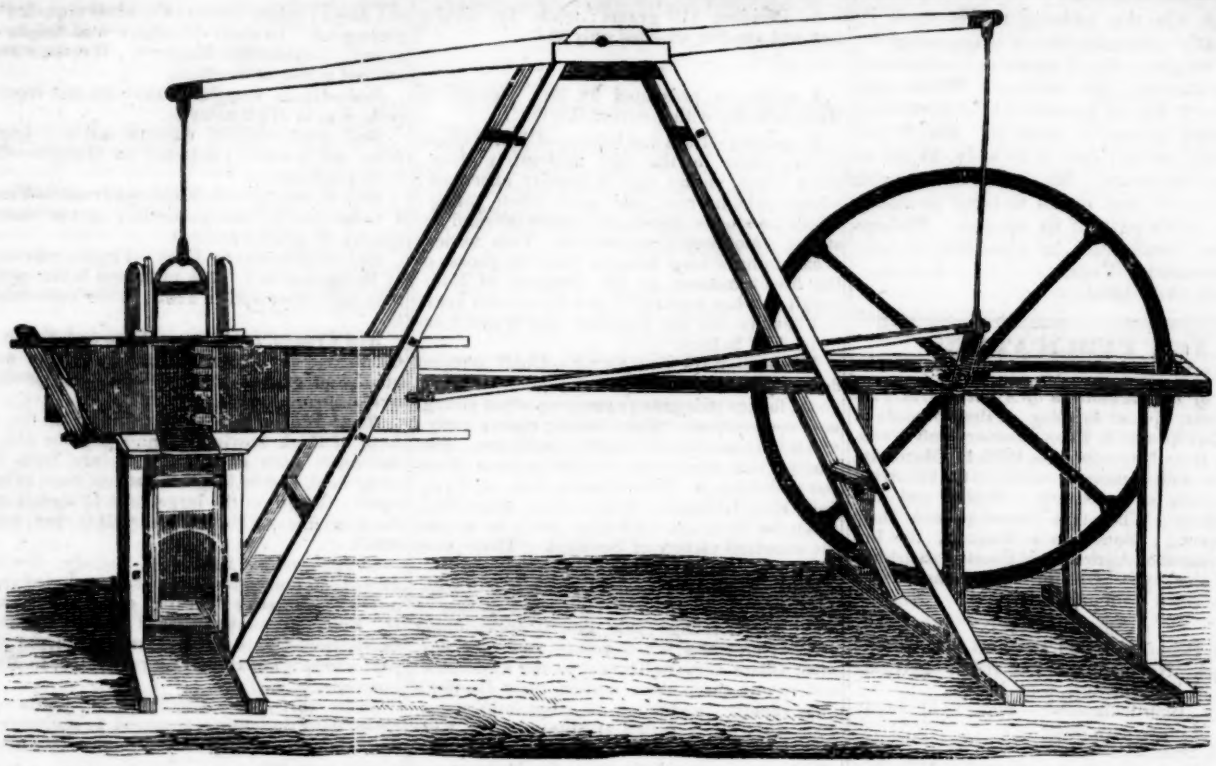
I have digressed more into detail on the difference of the species, which respectively yield the henequen and the pulque, from the belief that the undue authority of Humboldt, and the consequently vague use of the title Agave americana, have contributed to render the public incredulous of the special merits of the Agave sisalana. Henceforward, however, the local name of the principal product of each species shall constitute my specific names, and in this sense I shall add, that, however great be the number of plants in the green-houses of Europe and of the United States, which bear the names of Agave americana, it is probable that *there is not a single genuine Agave pulque or Agave henequen amongst the whole.*

CHARCOAL—FERMENTATION.—*Mr. Fleet:* I took one bushel of charcoal, pounded it partially, dug a hole in the ground, put in half the coal, then laid 4 quarts of fresh horse dung as near the centre as possible, put in the other half bushel of coal, and covered the whole with earth two inches deep. After 12 months I found the coal and horse dung in the same state that I deposited it. I took half a bushel of fresh horse dung and buried it near the coal; in a few days, it had entirely disappeared. From these experiments I inferred, 1st, That charcoal is incapable of fermentation of itself, and by its affinity for oxygen prevented its approach to horse dung buried with it; consequently no fermentation had taken place with the four quarts buried with the coal, and both remained entire; whereas the half bushel of fresh dung buried in a hole by itself had undergone fermentation and disappeared.

Yours, RATIO.

March 22, 1834.

FERMENTATION OF CIDER.—*Mr. Fleet:* One of my neighbors took three barrels of juice from the cider press, committed it to the still, determined to get all the spirit, and suffer no loss by letting it stand. He got no spirit. He took three other barrels, let it stand sixty days, then committed it to the still, and got 12 gallons of spirit. From this I infer that mere juice without fermentation contains no spirit, but that the spirit is produced by the fermentation. RATIO.



Flagg's Shingle Machine, for riving and shaving Shingles at one Operation. [Communicated by the Inventor.]

The above plate represents the Shingle Machine invented and patented by DAVID FLAGG, Jr., of the city and county of New-York, which can be seen at 104 Beekman street. It is one of the greatest labor saving machines in this country; it performs its work to great perfection, and at a rate almost incredible to all who have not seen it. It is very simple in its construction, and not liable to get out of order. By this machine sixty shingles are made from the bolt or block in one minute, being one a second, and more perfect than can be made with a frow and drawing knife, as they are usually made. The shingles are of a true taper from butt to point, and can be shaved to any given thickness. Any timber that can be split with a frow can be worked with this machine: pine, cypress, cedar, chesnut, oak, ash, hemlock, or any timber that will rive or split.

NEW-JERSEY MARL.—*Mr. Fleet:* Absence and other circumstances have, till this, prevented my further communications on the Jersey marl; neither am I now able to give a full analysis; however, I will state a few things that may not be generally known, and that will enable every farmer to try the strength of his own marl, and thus answer every ordinary purpose. The fertility of land depends on suitable proportions of sand, argil, water, and air. Of these, all soils are composed in different proportions. The preponderance of any one, or the addition of other bodies, of neutral or sterile influence, it is the object of the farmer to correct by manures. Thus a clay soil is benefitted by the application of sand, and vice versa. Lime is beneficial to a rank or sour soil, and equally injurious to a light, dry, poor one; therefore, whether a calcareous argillaceous marl is beneficial must be determined by the tenacity or looseness of the soil. The proportion of calcareous matter may be extracted from a given weight of the marl by solution in acids, and the residue being dried and weighed, will give the quantity of clay remaining. Jersey marl, (or shelly sand,) contains calcareous matter; it is a mixture of animal, mineral, and vegetable substances, containing a quantity of oil, and is therefore a manure and stimulant. The marl examined contained about 60 per cent. sand, 20 per cent. clay and mica slate, 10 per cent. carbonate of lime, and some sulphate of iron, &c. &c. Marl, like clay, belongs to secondary and alluvial earths; hence it may alternate with compact limestone or gypsum, or with sand or clay. La marne terreuse is found near Paris, in France, and is there extensively used as a manure. Cuvier, the celebrated naturalist, examined some of this marl, which contained numerous and interesting remains; but of their peculiar nature we are not informed. My former remarks were noticed, I observe, by an intelligent correspondent in Upper Freehold. I regret not being able to throw some light on the subject, but that it is an excellent manure for most soils, in certain proportions, is now no longer a doubt, and I shall next season give a good dressing with it to some very poor light land, having prepared it by a mixture with old leaves, yard manure, &c. &c. The part of the country I particularly spoke of was Shrewsbury, and I believe I am correct in the time it has been discovered: even that period reflects no credit on the farmers around, who have still so much waste land and worse cultivated. Yours, &c.,

D. A. AMES.

COMBUSTION.—*Mr. Fleet:* By way of amusement, I have taken a live coal from a blacksmith's fire, laid it on a small plate, and covered it with a hand-glass that would hold say two gallons. For a few minutes the coal continued to burn, but was soon extinguished as perfectly as if immersed in water. From this I have reasoned—why is the coal extinguished? Because the oxygen can no longer approach, and is all exhausted in the hand-glass, and without oxygen fire cannot be supported. I have put under the glass a lighted candle, and it was extinguished instantly. A mouse introduced expired in a few minutes. I therefore concluded that this oxygen was indispensably necessary to animal life. All the air under the hand-glass being exhausted of oxygen, and converted into carbonic acid gas, could no longer support either flame or animal life. The burning of the coal, so long as there was any oxygen in the air under the glass, was conclusive to my mind that oxygen was indispensable, and that all carbon in combustion is merely dissolved in oxygen; that combustion is a mere union of oxygen with the substance consumed, forming the carbonic acid gas or food of plants, the main substance of all vegetable and animal matter. RATIO.

March 22, 1834.

LIGHT AND EXCRETORY MATTER—*Errata.*—In the New-York Farmer for August, page 249, 3d question to Mr. Eaton, the word *line* is printed instead of *sun*. It should read—Does the light come in straight lines from the sun? At page 241, I notice an error either of the pen or of the press: the word *root* is used; it should be *not*—"I apprehend that it is the aroma, not the excrementaneous depositions." Yours, &c., R. M. W.

A QUEER ANIMAL.—*Mr. Fleet:* There is a queer animal among us which we are at a loss to classify; perhaps some of your correspondents, learned in natural history, can solve the difficulty, I will therefore give some of its peculiarities. 1st, It is 5 feet 10 inches high, and moves erect. 2d, It lives in a fluid and is said to carry about 30,240 lbs. weight, and has been known to leap 4

feet high with this amazing weight about it, apparently insensible that it is oppressed by such a weight. 3d, It seems to be endowed with something like reason. When any thing very hot is presented to it, it retreats and seems averse to handle it. 4th, It has no feathers on any part of its body, as far as has been discovered. 5th, It has been known to make love, and seems to have partiality for the female part of its species. Perhaps by these peculiarities its classification may be determined. Yours, RATIO.

March 14th, 1834.

NEW PUBLICATIONS.

Report of the Exhibition of Agricultural Productions, &c. at Stirling, at the premises of W. DRUMMOND & SONS, Nursery and Seedsmen, from November 16, 1832, till March 16, 1833; with communications on the following important subjects, viz.: Wedge and Tile Draining; Thorough Drainage and Deep Ploughing; Bones as a Manure; the Improvement of Agricultural Plants. Stirling: Published by W. Drummond & Sons. 1833. [Continued from page 234.]

MANGOLD WURZEL.

From Polmaise.—Soil, a deposit of river sand and mud. No manure. Six roots, aggregate weight 28 lb.; heaviest, 6 lb. 12 oz.

From Blairdrummond.—Soil, light sandy loam. Manure, cow dung.

From Deanston.—Extent, one acre. Soil, medium loam, ploughed up in spring 16 inches deep. 22 tons compost dung per acre, in drills. Same ground under Mangold Wurzel in 1831. Sown 19th April, 1832. 6 roots, aggregate 42 lb.; heaviest, 7¼ lb.

From Cambus—Soil, light loam. 24 tons dung per acre, in drills. Produce 42 tons per acre.

The cultivation of Mangold Wurzel does not seem to be extending. The root requires deeper soil than as yet can be generally afforded to it in this quarter.

—

Kohl Rabi, or Turnip Cabbage.—From Blairdrummond.

Do. do.—From Deanston.

Do. do.—From Messrs. Drummond.

The solidity of this root is much above the turnip medium standard. A bulb, which in size should by it only have been 2 lb. 2 oz., weighed 3 lb.

—

Drumhead Cabbage—by Mr. Robert Kay, Shiphaugh, grown in the field at Shiphaugh. Soil, clayey loam. Planted out in May at the rate of 8000 plants per acre. For the dairy, one acre is reckoned worth more than two of turnip. May be stored up, and by taking off only the outer leaves when used yield a supply till spring.

Nutritive powers of the preceding roots and vegetables:

			Nutritive matter.
Potatoes, 1 lb,	or 7000 grains,	contains	1000 grains
Carrot, 1 lb.	do.	do.	750
Parsnip, 1 lb.	do.	do.	700
Swedish Turnip, 1 lb.	do.	do.	440
Drumhead Cabbage, 1 lb.	do.	do.	430
Kohl Rabi, 1 lb.	do.	do.	420
Mangold Wurzel, 1 lb.	do.	do.	390
Common White Turnip, 1 lb.	do.	do.	320

This statement is taken chiefly from the Woburn Experiments. In respect to turnip, Mr. Sinclair mentions that the "quantity of nutritive matter, contained in different roots of the same variety, varies according to the size and texture of their substance. A root of the White Loaf variety, measuring 7 inches in diameter, afforded only 72 grains and a half; while the same quantity of a root, which measured only 4 inches, afforded 80 grains."

The middle sized roots of the common turnip are, therefore, the most nutritious; as, on the contrary, are the largest roots of the Swedish, affording 110 grains; while the middle size and smaller afforded only 99."

WHEAT.

A collection presented by Mr. Shirreff of Mungoswells, with descriptions, viz.:

Gregorian—Ears and Grain.—Chaff without down; joints (of the ear) moderately close; grain short, plump, and in quality excellent; folinge pale, narrow, and erect when young; tillers (or stocks) sparingly; straw tall, and not strong; moderately productive. This variety is said to have been brought from the shores of the Mediterranean by Dr. Gregory of Edinburgh. It has been cultivated for several years in Fifeshire and the Lothians, and is much esteemed by bakers.

Hunters—Ears and Grain.—Chaff without down; joints moderately close; quality of grain good; foliage pale green; creeping when young, and very narrow; tillers freely; ripens early; straw long and strong; highly productive. This variety was discovered in Coldingham Muir, Berwickshire, by Wm. Hunter, Esq. of Tynefield, East Lothian. It has been extensively sown for 30 years, and may justly be termed the standard variety of Scotland. These ears are from seed obtained at Tynefield.

Mungoswells—Ears and Grain.—Chaff without down; joints moderately close; quality of grain good; folinge pale green, approaching yellow; creeping when young, and very narrow; tillers very well; ears at the same time, and ripens three days earlier than Hunter's (Tynefield); productive in grain and straw. This variety was raised at Mungoswells, East Lothian. It resembles Hunter's in all respects, tillering perhaps a little more freely, having a larger ear and longer straw, to the extent of ten or twelve stone of 22 lb. per Scotch acre, by repeated experiment.

Mungoswells.—Two samples illustrative of the difference of colors in the same variety, being both sown from the same parcel in 1831, and three samples from clay, gravelly soil, and from loam.

Ross-shire—Ears.—This variety came from Somersetshire, where it is known by the name of Edward's Wheat. In Ross-shire it is called Drummond Wheat; and in East Lothian, Ross-shire Wheat.

Wheat from Kent—Ears and Grain.—Introduced into East Lothian by Mr. Howden, Chapel. Chaff without down; joints rather wide; quality of grain excellent; foliage very deep green, erect when young, and very broad, resembling that of the potato oat; tillers badly; ears seven days and ripens five days earlier than Hunter's (Tynefield); deficient in straw and grain.

Wheat Ears.—Chaff without down; straw pink-colored and long. Selected at Mungoswells in 1832, and the grain sown.

Wheat Ear.—Six inches in length; chaff without down. Selected at Mungoswells, and the grains (99 in number) sown November, 1832.

Woolly Eared variety.—Chaff without down; joints close set; quality of grain good; foliage deep green, erect when young. Tillers badly, deficient in straw: Ears 8 days, and ripens 2 days before Hunter's, productive on rich land, is frequently sown in East Lothian.

Woolly-eared, variety B.—Chaff downy; joints moderately close; straw long. Selected at Mungoswells in 1832, and the grains sown.

Blood Red—Ears and Grain.—Chaff without down; joints close set; quality of grain superfine; straw rather short; tillers well, and is highly productive. This wheat was introduced from Marklane into East Lothian, two years ago, by several individuals; it is said to be more productive of flour than any other variety, and to bake as well as the best Dantzig wheat; while it has yielded to the growers, this year, 1832, from 70 to 80 imperial bushels per Scotch acre. The straw is pink-colored before ripening, and is ten inches shorter than that of the Lammas Red.

Lammas Red—Ears and Grain.—Chaff without down; joints moderately close; quality of grain good. In color of foliage and habits of growth, it resembles Hunter's. It is the standard red wheat of Scotland.

Red—Grain samples.—Six varieties from a collection at Mungoswells.

Red—Ears.—Chaff without down; joints wide set, awned; selected at Mungoswells, from Lammas red.

Red Woolly-eared—Ears and Grain.—From a collection at Mungoswells; straw short; quality of grain excellent.

Red Woolly-eared—Ears.—From a collection at Mungoswells. This produced better grain than any other sort in 1832; straw moderately tall.

Red Creapy, or Creepy—Ears and Grain.—Chaff without down; joints very wide set; quality of grain inferior; tillers well, productive in grain and straw.

Revit Wheat—Ears.—Illustrative of the effects of thick sowing diminishing the size of the ears; both parcels of ears are from the same field, and in length of straw were nearly equal; (length of the large ears 4½ inches, and the grain fine; of the small ears 2½ inches, grain small.)

Revit, variety B.—Chaff slightly downy; awned; joints moderately close; quality of grain inferior, but better than that of varieties C and D. Folinge resembles that of D; straw 9 inches shorter. This species was sent from Essex, where it is extensively cultivated, to Mungoswells, in 1831.

Revit, variety C.—Chaff downy; joints very close, with the grains arranged latitudinary in a peculiar manner; quality of grain very coarse; ripens very late.

Revit, variety D.—Chaff downy; awned; joints rather wide; grain very coarse; folinge pale green; creeping when young; ears with Hunter's, and blossoms and ripens eight days later; tillers sparingly; exceedingly long and strong in straw; very productive. This variety, in point of straw, seems to partake of the nature of rye, and is congenial to light sandy soils, on which it is deserving of culture. It is said, by Mr. Gorrie, to resist the wheat fly, which is not always the case.

Egyptian—Ears and Grain.—Ear compound, awned, and slightly downy; coarse grained; long strawed; and a bad tillerer. The straw is furnished with a pith, or is solid, which seems to be a provision for the heavy ear.

Egyptian and Revit—Family Group; varieties A, B, and C.—These wheats are similar in habits of growth, foliage, and form of grain. Revit A forms a contrast to Revit C; the ear of the one being nearly twice the length of the other, yet does not contain a greater number of grains.

Wheat—Ears.—Illustrative of the effects of the Wheat Fly.—The fly deposits eggs in the flower, when the ear is escaping from the sheath; and the eggs produce maggots, which devour the young grains, or prevent their formation. The ears are chiefly affected on one side, which becomes collapsed as the plant reaches maturity. This bundle of ears is a fair specimen of the wheat crops in East Lothian, during 1827, '8, '9, '30, and '31.

Presented by sundries, viz.—

Anti-Fly Wheat—Triticum turgidum var.—By Mr. Gorrie, Annat Gardens. Is very prolific; but from its appearance in the field might be what is termed a scourging crop, and for poor light soils rather severe. Should the fly keep away for some time, this variety will not be much cultivated.

Yellow Saffron—Grain.—By Mr. Espie, Powside, Airth. Is very productive. Clayey loam.

Do. do.—Grain.—By Mr. R. Paterson, Frew. Sown on fallow 29th September; reaped 21st August. Soil, clay. Weight per bushel, 63 lb.

Do. do.—Grain.—By Mr. Stark, Camelon, who has grown this variety for a number of years. It gives sure crops, and fine sample.

Talavera—Grain.—By Mr. Lawson, Edinburgh.

Do.—Grain.—By Messrs. Drummond. Quality of grain very fine, and brings from 2s. 6d. to 5s. per quarter, in the market, more than any other variety; productive, but rather precarious, unless sown in spring.

Nepaul Wheat—On the Straw and in Grain Samples.—By Messrs. Drummond, grown in their nursery grounds, from seed which was obligingly sent them last spring by Mr. Warden of Parkhill. Appears in some points to resemble naked or wheat barley; straw very short, scarcely 3 feet, but tillers remarkably well; and from the extreme earliness of the plant it might be useful. This specimen, sown on the 17th April, ripened by the 12th July. Another parcel, sown for trial on the 20th June, was in ear by the end of July, but the plants were attacked and spoiled by rust in August.

BARLEY.

Barley—Dryfield.—From Coldoch, first crop after turnip, with bone manure, 8 bolls per acre; Mr. Arthur, Footofgreen; Mr. Boyd, Minehouse, 59¼ lb. per bushel; Mr. Grindlay, grown at Inneraven, Linlithgowshire, 58¼ lb. per bushel; Messrs. Black, Ford Mills, Berwick; Mr. Charles M'Gregor, Cambusbarron; Mr. Parlane, grown at Newton, 56 lb.; Mr. John Robertson, Hollinbush, 20 stone per boll; from Carmuirs farm, near Falkirk; and from Mr. John Buchanan, Mollan, near Callander, 20 stone per boll.

Do.—Carse or clay soil.—Mr. Robert Paterson, Easter Frew, 57 lb. per bushel; Messrs. Carmichael, Raploch farm, 57¼ lb. per bushel; Mr. M'Laren, Corntown; Mr. Cowbrough, Dykes; Mr. Parlane, grown at Frew, 57 lb. per bushel; Mr. Carlaw, Forthbank; Mr. J. Christie, Newmills (English and Scotch); Mrs. Dow, Spring Kerse; Mr. Buchanan, Whitehouse; soil, thin stiff clay; average crop 5 bolls per acre, 19 stone per boll.

Do.—From the Himmalaya Mountains, Hindoostan, where it grows at the height of 10 to 12,000 feet.—By Miss Speirs, Gargunnock House.

Do.—A luxuriant plant of spontaneous growth; 46 stalks.—Mr. J. Rankine, Kilsyth.

Annat Barley.—By Mr. Gorrie; which he found accidentally. It yields a beautiful sample; and being short in straw will suit rich soil.

African Barley.—By Mr. Gorrie. Sent to him by Mr. Neill, who had it from the Consul at Tangiers. Mr. G. intends it to cross with.

Naked Barley.—From the Experimental Gardens, Edinburgh.—By Mr. Neill.

Do.—By Messrs. Drummond. From a light loam, sheltered; grew luxuriantly; productive; grain full, plump at first, but liable to shrivel when exposed to the air.

Black Siberian Barley.—By Messrs. Drummond. Appears very hardy, early and productive; straw rather coarser than that of the Naked Barley; ear large; grain beautifully white when the husk is off.

OATS.

Flemish.—By Mr. M'Queen, Arnive. Soil, stiff clay; yielded 19½ pecks meal to the boll.

Potato.— Mr. J. Buchanan, Touchmoller. Light soil.

Hopetoun—Grain, and on the Straw.—Mr. M'Ewan, Blackdub. Grown on carse soil, after five years pasture; crop excellent. One sample after one year's pasture.

Do.—On the Straw.—Mr. Henderson, Haugh. From clayey loam; height of straw 5 to 6 feet; crop very fine.

In a communication just received from Mr. Learmonth of Parkhall, he mentions that "his crop 1831, of the Hopetoun Oat, on an average, gave 15 bolls per acre, and 43 lbs. per bushel, on a strong clay soil, well drained." He had not then ascertained the amount of crop 1832.

Black Tartarian.—Mr. John Main, Glen, near Falkirk.

Do. do.—Mr. J. Christie, New Mills. Carse soil. 13 bolls per acre.

Do. do.—Ear.—A variety. Mr. M'Laren; panicle 1 foot in length; 262 grains, spikelets close set, has produced 18 bolls per acre.

Lothian White.—Mr. Boosie, Parkhead. Soil, light loam.

Do. do.—Also 5 stalks 7 feet high, found in middle of a luxuriant field; one of the ears numbered nearly 300 grains.

Naked or Huskless Oat—On the Straw.—Mr. Lowis of Plean.

Four-seeded Riga Oats—Ears.—By Mr. Gorrie, Annat, picked out of a sample of Riga Oats. Mr G. intends to keep it to cross with.

Brown Riga Oat—Grain.—By Mr. Gorrie; selected from a sample of Riga oats, 2 years ago; is thin skinned; early; long in straw and very prolific.

RYE.

Grain sample.—By Mr. Scott, Blair Cow Gask, Perthshire. Soil, bleak clay fallow. Produce on 1½ roods, 14 threave, after 6 pecks of seed. Return 8 bolls.

BEANS, &c.

Grain and Straw.—Dryfield drilled.—From Deanston farm. Seed, from Robert and William Carrick, Baad; after oats, dunged and ploughed in autumn, 1831. Extent, 5 acres. Soil, medium loam; drained and trench ploughed; 20 field carts farm yard dung per acre. Sown 18th February, reaped 11th August, 1831. (The stalks of the specimen 5 to 6 feet, and averaged 50 pods on each.)

Do do.—Dryfield drilled. By Mr. D. M'Farlane, Sessintilly. 7 bushels were sown after oats, and slightly dunged; produce 24 bolls. (Stalks of the specimen 5 to 6 feet, and 30 to 95 pods on each plant.)

Winter Beans—On the Straw.—Messrs. Carmichael, Raploch farm. Generally sown in autumn. This specimen was for trial, sown end of February, and reaped in September, 1832. Stalks 3 to 4 feet, and podded to the bottom.

Prolific White Tares.—By Mr. Gorrie, sent to him from Mr. Loudon, under the name of Napoleon pea. It is pretty luxuriant in straw, and uncommonly prolific in seed.

Narbonny Vetch—Vicia narbonensis.—By Mr. Gorrie. An excellent spring and summer vetch. Should be sown early in October. It yields a great mass of beautiful vegetation in June and July.

In the grain department, we have been anxious to collect as many specimens as possible, the principle aim of the exhibition being to afford the means, by comparison, and otherwise, of better ascertaining the relative value of the different sorts, to assist in effecting greater certainty and precision in naming, and to introduce new and improved varieties to the notice of the cultivator,—not that the multiplication of varieties is in itself any advantage, but surely the best mode of limiting that is by the improved superseding the degenerated and inferior.

"The selection and propagation of improved agricultural seeds," Mr. Loudon observes, "has till lately been very little attended to. But the subject has been taken up by Mr. Sinclair of New Cross, Mr. Shirreff of Mungoswells, Mr Gorrie of Rait, (Annat Gardens,) and others, and we have little doubt some greatly improved varieties of our more useful field plants will be the result.—[Encyclopædia of Agriculture, p. 786.]

Mr. Shirreff, when he visited the exhibition, selected a few seeds of each variety with their local names, and next season we expect, among other things from him, to be favored with a collection of oats, with their distinctive characters. We also hope for something of interest from Mr. Gorrie.

MANUFACTURED PRODUCE.

Malt.—Completed and in operation. Do. dried from peat. By Mr. Parlane, Stirling.

Potato Flour.—From the farm of Northfield

Do.—38 years old. Presented by Miss Colquhoun, Melville Place, Stirling. In fine condition. Made at Camstradden in 1794, from potatoes which had been damaged by a sudden rise of Lochlomond. Frosted potatoes do equally well.

The flour is granulated over the fire in a large circular pan, kept constantly stirred with a flat piece of wood, at a temperature of 150 Fahrenheit, until it becomes quite dry, hard and gritty.

The manufacture of potatoes is still in rather a primitive state in this country—in France it is carried on extensively.

Macaroni.—By Messrs. Drummond; manufactured from wheat in Italy. The finest grain is used for that purpose, being made into a paste, and by machinery into the present form. This article may be termed the Italians' "Staff of Life."

GRASSES.

Seeds.—For pasture or hay, 57 specimen boxes, correctly labelled. Exhibited by Mr. Lawson, nursery and seedsman to the Highland Society of Scotland.

Do.—A selection for permanent pasture, by Messrs. Nash and Adams, seedsmen, London.

Do.—A selection for permanent pasture, hay or green food, by Messrs. Drummond.

Dried Bunches.—15 species of the most useful native grasses, by Mr. James Drummond, gardener, Blairdrummond.

Do. do.—30 species of the best native grasses, by Messrs. Drummond.

Elymus sibericus.—Siberian Lime Grass.—By Mr. Gorrie, Annat Gardens. Is leafy and luxuriant in summer, and might form an excellent mixture with timothy, either for hay or pasture.

Poa nemoralis—Wood Meadow Grass.—By Mr. Gorrie. Best grass for thriving under trees, but will not prosper in open ground.

Chichorium Intybus, or Wild Succory.—By do. If sown in March, and planted out in May, 8 inches apart or thereby, Mr. G. knows of no plant that will yield nearly the same weight of food for cattle or pigs, or that requires less care or culture.

Annual Rye-Grass.—A luxuriant plant.—By Mr. Robert Kay, Shiphaugh. Of spontaneous growth, 320 stalks, 2½ to 3 feet high, and yielding 46,000 seeds.

Lucerne.—By Mr. Kay. Specimen of second year's crop; second cutting, 24th August, 1832.

Dried Specimens in sheets, being a collection of the proper grasses, clovers, and other plants, for hay or pasture. By Messrs. Drummond, viz:

English Name.	*Systematic Name.*
*Rye-Grass Peren. Russels	Lolium perenne
.... Paceys	
.... Scotch	
.... Annual	
*Cocksfoot	Dactylis glomerata
†*Catstail, or Timothy	Phleum pratense
*Meadow Foxtail	Alopecurus pratensis
Alpine	.... alpinus
†Meadow-Grass, rough stalked	Poa trivialis
.... smooth	.. pratensis
† .... fertile	.. fertilis
* .... narrow-leaved	.. angustifolia
.... nerved	.. nervata
*Fescue, Meadow	Festuca pratensis
† .... hard	.... duriuscula
.... sheep	.... ovina
.... awned sheeps	.... hordeiformis
.... spiked	.... lol acea
.... smooth	.... glabra
†Crested Dogstail	Cynosurus cristatus
*Sweet scented vernal	Anthoxanthum odoratum
*Tall Oatlike, Soft Grass	Holcus avenaceas
Woolly	... lanatus
†Creeping Bent, or Fiorin	Agrostis stolonifera
Common ...	.... vulgaris
Waved Hair Grass	Aira flexuosa
Common Quaking Grass	Briza media
†Yellow Oat Grass	Avena flavescens
†Clover Red	Trifolium pratense
.... Perennial	.... perenne
† .... White	.... repens
.... Crimson	.... incarnatum
.... Yellow	Medicago lupulina
Lucerne	.... sativa
Saintfoin	Hedysarum or obrychis
*Vicia sepium	Creeping vetch
Rib-Grass	Plantago lanceolata
Yarrow	Achillea millefolium

Those marked thus * afford the principal grass in spring and summer. Those marked † afford the principal summer and autumn grass.

Sheet No. 1, containing a selection for hay and pasture, in rotation cropping, viz.:

For Hay.

Rye-Grass with Clover. Cocksfoot with or without Clover.

The Cocksfoot is here placed along-side of the Rye-Grass, as by some, who have given the best attention to the subject, it is esteemed, even for hay, to be of greater value, being much less impoverishing to the soil, more productive and nutritive, and affording better aftermath, or second crops. As a pasture grass, the superior merits of Cocksfoot appear unquestionable; and it might be an interesting subject for the agriculturist, by giving it a fair trial, with and without clover, on the same field with rye-grass and clover, to determine whether it is to rise or fall in the hay scale.

Cocksfoot, timothy, hard fescue, rye-grass, and clovers; these were combined and tried on the same field with rye-grass and clovers, at Mungoswells, to the advantage of the former.—[Vide Quar. Jour. of Agri., vol. ii.]

For Pasture, in Rotation Cropping.

Cocksfoot, three parts.
Peren. Rye-Grass, Hard and Smooth Fescue, Meadow Catstail, White Clover, } one part.

The above may be sown at the rate of two bushels per acre.

Pacey's Perennial Rye-Grass, 1 bushel
White Clover, 10 or 12 lb. } per acre.

Sheet No. 2, containing a selection for permanent pasture, on good loam, viz.:

Cocksfoot,	1	bush.	Crested Dogstail	½	peck.
Peren. Rye-Grass	1	..	Fiorin	½	..
Meadow Fescue	½	..	Narrow Mead'w gr.	½	..
Hard do.	½	..	Sweet Vernal	½	..
Meadow Foxtail	½	..	Creeping Vetch	½	..
Rough Meadow gr.	1	peck.	White Clover, 5lb.	½	..
Timothy	½	..	Red Peren. do. 2lb.	½	..

amounting to 4½ bushels of the mixture for one Scotch acre.

The above are somewhat different from the proportions stated by Mr. Sinclair of New Cross, but from minute observation, we are convinced the selection is best suited to this climate and district. Mr. Loudon recommends that at least one half of the seed be that of the perennial rye-grass, which, in some cases, might be adopted with advantage. Should the soil incline to clayey loam, the meadow fescue and foxtail might be augmented, making a deduction from cocksfoot and hard fescue, and *vice versa* for a sandy loam.

The 4½ bushels will not furnish more than 7 fertile seeds to the square inch, being the number of plants that the best natural pastures contain. Should there be fewer sorts, less seed is required—but there should never be less than to furnish 3 plants to the inch. The great advantage of sowing a number of sorts is that more plants can be got to thrive closely together, and the different kinds arriving successively at their greatest vigor present, almost throughout the year, a dense surface of grateful herbage.

Sheet No. 3, containing a selection for permanent pasture on tenacious clay soils, viz.:

Meadow foxtail, meadow fescue, timothy, rough-stalked meadow grass, crested dogstail, white clover, red peren. clover, rye-grass, and cocksfoot.

The proportions in the order of the list, the foxtail being the largest. 4 bushels of seed per acre.—[Vide Quarterly Journal of Agriculture, No. 18.]

Sheet No. 4, containing a selection for permanent pasture on poor and inferior soils, viz.:

Cocksfoot	1	bush.	Crested Dogstail	½	bush.
Aw'd Sheep's fescue	1	..	Yellow Oat-Grass	½	..
Hard Fescue	½	..	Smooth Fescue	½	..
Peren. Rye-Grass	½	..	White Clover	5	lb.

Sheet No. 5, containing a selection for permanent pasture on poor soils and elevated situations, viz.:

Sheep's fescue, common bent-grass, alpine meadow grass, alpine foxtail, common quaking-grass,—the first in greatest proportion.

Sheet No. 6, containing grasses for lawns, viz.:

Crested Dogstail	Waived Hair-Grass
Alpine Meadow-Grass	Crested do.
Sheep's Fescue	Hard Fescue

For growing under trees.

Wood Meadow-Grass	Wood Bent-Grass

Sheet No. 7, containing a selection adapted for the straw plait manufacture, viz.:

Wheat—Triticum æstivum.—A prepared or bleached specimen. From the valley of the Arno, in Italy, where it is cultivated on sandy soils for the manufacturing of the leghorn bonnets.

Rye, cultivated in Orkney, for straw plait, in imitation of Leghorn.

Upright Mat-Grass—Nardus stricta.—Perhaps the best grass for that purpose.

Narrow-leaved meadow, meadow barley-grass, sweet vernal-grass, crested dogstail, varieties of fescue and of bent-grass, have all been recommended for straw plait.

[For ample details respecting grasses, see Mr. Sinclair's valuable treatise, Hortus Gramineus Woburnensis.]

(To be continued.)

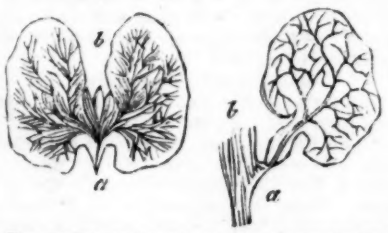
Alphabet of Scientific Gardening for the Use of Beginners. By JAMES RENNIE, M. A., Professor of Zoology, King's College, London. 18mo. pp. 120, William Orr, London, 1833. [Continued from page 235.]

Scientific Principles of Seed Sowing.—I have already hinted that the food of young plants, when they first germinate, or begin to *braird*, as it is provincially termed, is very different from that of full grown ones; for, instead of taking up the ordinary food, they depend, in a great measure, upon the materials stored up in the seed, in much the same way as the chick, before it breaks out from the egg, depends in a great measure upon the food stored up there. I have used the qualifying phrase, "in a great measure," both in the case of the young plant, and of the chick, though it may appear, at first view, to some, that the chick enclosed in the shell has no means of obtaining any food not included in this from without,—but two other principles are indispensable; I refer to heat and air.

Heat, if it do not form a portion of the food of the chick, and of the plant, is indispensable, either for exciting and stirring up into activity the vessels which carry the nutrient materials to the parts where they are wanted, as all fluidity depends on heat, for rendering the food sufficiently liquid to pass into and along these vessels.

Such is the theory, and it accords with the established facts, that a chick cannot be hatched in a heat less than one hundred and four degrees of Fahrenheit, while seeds require heat from forty to eighty degrees, above or below which they will not germinate well. As we have seen, however, that buds once roused into growth, will go on to grow even when cold recurs, so seeds, after germinating in artificial heat, may have the plants thus produced planted with success in the open air.

Eggs during the process of hatching, broken open to show the vessels supplying nutriment to the chick, which is sown separate from the egg on the left.



The nutrient vessels in the seed lobes of a germinating bean magnified.

Air is supplied to the chick in the egg through the minute pores, or holes, in the shell, and probably to the seed of the plant in a similar way, though this is a point not well known. It is the oxygen of the air which is the indispensable material, both to the chick and the plant, for when confined in carbonic acid gas, or in azote or hydrogen, they both die. Too much oxygen, however, like too much heat, will excite growth too rapidly, and disease, and at last death, will be the consequence.

Effects of Water and Steeping.—So far the chick and the seed have a close resemblance; but water, so indispensable to a grown fowl, would, in the smallest quantity, kill the chick in the egg, while it is equally necessary for the evolution of the plant from the seed, as it is to the full grown plant. Seeds, that appear to have germinated without water, must have derived moisture from the air.

The principal effect of the water, when introduced within the shell of the seed, appears to be that of dissolving, or, at least, rendering more liquid, the portion of it whose use is similar to the contents of a bird's egg. The starch also which is generally, if not always, in this portion of the seed, is converted into sugar, a process that can be imitated artificially. Along with this some mucilaginous matters are observed rendering the food of the embryo plant not much unlike, in chemical qualities, to animal milk. The contents of the seed, thus changed into a sort of milky pulp by the addition of water, swell by degrees, and the first point of the future root having formed, breaks through the shell in a downward direction, (*a*,) and about the same time, the first point of the future stem comes forth in an upward direction, (*b*,) as may be seen in the figures.

It will be an obvious inference respecting water, that, like the oxygen and the heat, if it be in too great quantity it will render the contents of the seed too thin and weak, and will also increase their quantity so much that the vessels of the embryo plant will be gorged, and disease or death will follow. When the quantity of water again is not enough to produce this effect, still it may be in such large proportions as to push the growth too rapidly for the health of the plants, which will in that case be too pale on appearing above ground. Hence the importance is clear, of sowing in dry rather than moist weather.

Hence also the practical error, at least in most instances, of steeping seeds; which is chiefly useful in separating the infertile seeds that may swim on the water. All steeps which contain any thing but water and oxygen gas are unnatural, and must be injurious; such, for instance, as urine, or drainings of dunghills loaded with humic acid, which embryo plants cannot feed upon, no more than a new-born infant could drink strong ale or wine with impunity. Some strong infants might survive taking such drink, as some strong seeds may survive the steeps, but these survivals would not justify the practice. Steeps are recommended with a view to destroy the eggs of insects, but I am not acquainted with any destructive garden insect that lays its eggs upon seeds, and I am quite positive, supposing them to exist, that no steep would kill such eggs which would not at the same time kill or greatly injure the seed.

I am aware of the effect of light upon the hatching of the eggs of birds, though with respect to the eggs of many insects, light certainly does not prevent them from being fertile. On seeds, light acts so powerfully in retarding their germination, that though they have a due degree of heat and a due supply of oxygen and water, they will not grow, at least healthily, unless in the dark. The reason is that light causes the oxygen, which is indispensable for their growth, to be carried off, and fixes in them the carbonic acid gas which is yet as improper food for the embryo plant as beef would be to a new-born infant; whereas in the dark, the carbonic acid gas escapes into the soil, while the oxygen is taken up into the embryo plant.

Hence the importance of putting seeds deep

enough into the soil to exclude the light, taking care at the same time not to put them too deep to be out of the due influence of fresh circulating air. From half an inch or less to an inch, is about the average depth for garden seeds.

Time of Germinating.—Some seeds, such as those of the coffee plant, require to be sown immediately on being gathered, otherwise the nutrient matters contained in the shell become too hard to be dissolved in water. Others, as holly berries, require to be kept for about twelve months to mellow. It is said, and I believe in many instances proved, that seeds, such as those of balsam, if kept for several years, are more apt to produce plants with double flowers, in consequence, it would appear, of their nutrient matter being more condensed.

The period between sowing and germinating is very different according to species. Mustard for example will germinate in one day, or less, if stimulated with chlorine; cress in two days; turnips in three days; lettuce in four days; parsley in about six weeks or two months; the peach in one year; and the rose and filbert in two years.

It has been proved by experiment that seeds gathered before they are quite ripe, germinate sooner than very ripe ones, obviously because the nutrient matter is less hard and more easily diluted with water; and on the same principle, I have proved by experiment that potatoes, when saved green for planting and kept in bran, will come several weeks earlier than others. It would be worth trying the roots of the dahlia and marvel of Peru on the same principle. Though seeds when gathered before they are quite ripe germinate sooner, it does not follow that they will produce the best plants.

Scientific Principles of Transplanting.—The removing of growing plants from one part of the garden to another is done for various reasons, and the science of transplanting will consequently depend on the intention of the gardener in the operation. The principal facts to be recollected are, that every plant takes its food by the tips of the root fibres, and that the sap thence carried up into the leaves has much of its water and oxygen carried off by exposure to light, particularly to sunshine. It follows that if part or all of the tips of the root fibres be broken off or bruised, the plant will be kept hungry or starved, just as an animal would be with its mouth much injured or blocked up, while if a plant in such a state is placed in the sunshine, the water and oxygen carried off thereby will very soon cause it to flag, wither, and die.

Transporting.—If the gardener's object then be simply to move plants from one place to another, without affecting their growth in any way, it will be important to preserve every root fibre entire, and even, when this can be done, to take it up with part of the soil in which it has been growing, or with a large ball of earth, as it is termed. When this cannot be done, the root fibres ought to be placed in their new station as nearly as possible in the manner they were at first, and hence dibbing where the soil is at all stiff will be bad practice, from its being certain to confine and crush the root fibres within the walls of the dibbed hole.

It is partly upon the principles here laid down, that Sir Henry Steuart, of Allanton, has succeeded in removing the largest trees without heading down the branches, as was wont to be practised.

If it be found impossible to preserve the root fibres from injury, or to replant them exactly as they were, then in order to diminish the loss of water and oxygen the plants ought to be shaded from the light, or, if that cannot be done, they ought to have a suitable proportion of their leaves or branches cut off. De Candolle says this practice was wont to be so universal on the continent, that the gardener's maxim was, "if you plant your own father, you must cut off his head." Sir H. Steuart has proved the bad science of such universal barbarity.

Without taking up the soil in an undisturbed state, it is difficult to transport, uninjured, plants having few root fibres and large leaves, such as the poppy, because the few spongelets of the fibres which supply the sap are apt to be obstructed in a new soil, even when free from injury.

Pricking out Seedlings.—The object in what is termed pricking out seedlings is different from simple transportation. In the case of early lettuce, for example, or early annuals, such as balsams and coreopses, (it is correct to say "one Coreopsis" and "two Coreopses,") it arises from the necessity of sowing the seed under the influence of artificial heat, in order to get plants of some size sooner than they could be had by sowing in the open air.

The lettuces cannot be improved and are almost certain to be injured by the operation, in consequence of their small number of root fibres (not quite so few as in the poppy) and the largeness of their leaves. Accordingly lettuces, when pricked out under the most favorable circumstances of moist cloudy weather, always flag more or less, and hence leaves are apt to be checked in their growth so as to be less juicy, their juiciness depending on the most rapid and unchecked growth that can be effected. Rich soil, however, and plentiful watering, may overcome the check in the growth from pricking out.

In the case of the balsams and the coreopses, the check in growth from pricking out is advantageous, because the leaf pulp becoming much thickened (technically *Inspissated*) by the great loss of water and oxygen, when it returns to the stem and to the life knot (in Latin, *Collum* and *Torqua*; in French, *Collet*,) or crown of the root, it lays the basis of fresh branches terminating in flower buds. Whereas, were a seedling plant to remain unmoved in a rich soil well watered, it would probably send up more sap than the light could readily deprive of its water and oxygen, and thence would push out new leaves to carry off the superabundance, while there would be no pulp formed thick enough and containing enough of carbon to produce flowers.

For the same reason, either kidney or broad beans, if taken up and transplanted when only a few inches high, will have their growth checked, and will flower and fruit sooner, though they will not grow so tall as those which have not been transplanted. It is on the same principles advantageous to transplant broccoli, Brussels sprouts, and cauliflower, which will make them head more readily, though care must be taken that the growth is not so much checked as to render the heads small and their stalks tough. Trees are, in their younger state, frequently transplanted by nurserymen to increase their root fibres.

It may with this view also be advisable, in some instances, to trim off some of the root fibres, to diminish the supply of sap, and cause new root fibres to grow; a thing which ought never to be done where luxuriance of leaves is an object, and hence the old practice, of trimming both the root fibres and the branches or leaves at the same time, is in most cases highly absurd.

Scientific Principles of Striking.—By certain experiments, not by any means praiseworthy, yet, beyond all question, correct, it has been proved that, if the head of a snail, or of an earth worm, be cut off, the body will not only live for a considerable time, but a new head will be reproduced, with a mouth capable of taking food. By similar experiments, it has been found that the legs of spiders, and the feet of frogs, when cut off, are reproduced.

Upon a similar principle, when the roots of certain plants, which are to them what the head is to animals, are cut off, new roots may, under peculiar circumstances be reproduced. The chief condition required for the reproduction of such roots, is the preservation of their life till the roots have time to form, and various expedients are resorted to with this view, as well as for the quick production of the roots.

Chinese Mode of Striking.—The simplest mode of striking is that practised by the Chinese, and which I have tried successfully with the lilac. Lord Macartney was surprised to find in the Emperor of China's hall of audience a number of dwarf pines, oak, and orange trees bearing fruit, in frames filled with earth, and placed on tables. These are produced by selecting a fruit-bearing bough, with a good branchy head, and taking off from the stem a ring of bark about an inch in length. Around this is placed a ball of rich earth, tied on with bass, or coarse cloth, and the whole is kept moist by means of a vessel of water hung over it with a very small hole, or a thread, to convey the water drop by drop. The descending pulp being stopt short in its passage downwards towards the root, first forms root buds, which soon send out roots into the moist earth, and when these are deemed strong enough to feed the plant, the branch is cut off a little below, and the tree in miniature is ready for planting in a pot.

The process has been varied by having garden pots made so as to enclose the ring branch, and in this way dwarf fruit-trees are often formed on the continent, where they are much prized.

Striking by Layers.—The common mode of striking by layers proceeds on the same principle. Some plants may be said to propagate themselves by layers, such as the strawberry, which sends out runners that take root, and the ends of the common bramble sometimes take root in a similar way. A willow or a privet branch also, if accidentally bent down into the ground, will send out roots, and become a new tree if separated from the parent.

But in most instances, it is requisite so to interrupt the downward flow of the pulp, as to cause it to form root fibres, and hence, in practice, the branch intended as a layer is slit, tongued, or cut half through in a direction sloping upwards, or it is ringed as in the Chinese mode, or it is pierced in several directions by a brad-awl, or it is wired or twisted; all of which operations have the same design of checking the descent of the pulp, while the sap going up in the more central parts is not interrupted, and consequently the layered branch grows as well, if not better, than if it had not been so treated. The soil ought not to be too damp, otherwise the cut part may canker.

Towards the end of the autumn, layered plants are, for the most part, sufficiently furnished with new roots to feed them without farther dependence on the parent plant; but they are in general still weaker than seedlings, and require to be not only watered, but the more tender sorts not exposed to too bright sunshine.

Striking by Slips or Cuttings.—In the preceding modes of striking, the layer being partly in communication with the parent plant, is in no danger of perishing for want of food; but, in the case of cuttings, the circumstances are much the same as in the experiments alluded to, made upon the snails and earth worms, inasmuch as they are deprived of their natural feeding organs, their root fibres. In the first instance, therefore, a cutting, like the headless snail and earthworm, must live entirely on the nutrient materials it already possesses, which are, as we have seen, partly laid up in the cells of the stem, but more particularly in the buds. Hence it becomes important to have a bud, or buds, on every cutting intended to be struck; but leaves, or at least many leaves, are disadvantageous, as tending to exhaust life, by giving off too much water and oxygen. In the case of evergreens, however, in which the action of the leaves is so slow as not to produce exhaustion, they must be left on, to assist in maturing the pulp for the new roots, but no such leaves must remain below the surface of the soil, lest canker ensue.

The end of a cutting, to be planted in the soil, ought to contain a heel of older wood than

the bole, or stem, and be cut very smooth, in order to prevent water from stagnating in any crevice or bruise, and thus tending to rot the part. The heel of older wood is to prevent too much water being taken up by the more active and more open vessels of the bole, which would render the whole dropsical and sickly.

For the same reason, rich earth, very retentive of water, is bad for most cuttings; and species difficult to strike require to be planted either in pure sand, or in a soil containing a large proportion of sand, to drain off all superfluous water, which ought to be supplied in small quantities, but frequently, so as to keep it in constant circulation. Hence, orange trees can only be struck by a drain of broken pots-herds in the bottom of the striking pots. This is one of the true scientific principles of striking cuttings.

Another is founded on the effects of light upon leaves, or buds, which being furnished with only a scanty supply of food, cannot stand much loss of water and oxygen; and hence they are covered with a bell-glass, both to modify the intensity of the light, (some light is indispensable,) and to render the included air moist, from the water given off in the form of vapor. Some fresh air, however, is as necessary as some light, in order to produce a healthy leaf pulp, and hence the bell-glasses must not be kept air tight.

The same principles of supplying regularly a moderate portion of water, so as not to cause dropsy by over-gorging, and of sheltering from too much dry air, and bright sunshine, so as not to cause exhaustion, regulates the striking of buds, or *eyes*, as they are termed, which always require a leaf attached, and even of leaves themselves, such as those of the cacti.

The after management of cuttings which have struck, is precisely like that of layers.

PARLEY'S MAGAZINE.—This is a cheap little publication, from the Boston Press, designed for youth. It is embellished with numerous engravings, which, together with the reading portion, is most admirably calculated to increase a taste for useful information.

THE PEOPLE'S MAGAZINE.—This is a semi-monthly sheet, at one dollar per annum. The subjects are such as are calculated to interest every member of a family. The work contains many pleasing and useful engravings. Published by Lilly, Wait & Co., Boston, and by Goodrich & Wiley, New-York.

NEW-YORK FARMER.

SEPTEMBER 1, 1834.

WEATHER AND CROPS FOR AUGUST.—Up to the 25th of this month, the weather has been very hot, with the exception of a few cool days, commencing about the 18th. At present the ground is become quite dry, and vegetation begins to suffer. From every part of the country we learn that crops have been abundant, and very generally well secured. Corn is still promising. In this section, we believe, an increased quantity of turnips has been sown.

Connecticut.—In a postscript to a business letter, the Post-Master of Hartford, Connecticut, under date of August 9, sent us the following interesting remarks.

We are now suffering from a drought uncommonly protracted and severe; it was three weeks last Friday since we have had any rain. There have been some showers among us, but we have not been favored with rain sufficient to lay the dust. The dews have generally been heavy, and vegetation has sustained itself remarkably well until within a few days. It is now suffering greatly, and many plants, particularly in gardens, appear to be in a life or death struggle. The drought, I perceive, has a bad influence on the flowering of many plants, which do not wither or apparently suffer from its effects in their growth: this is particularly true of the dahlias; many of mine, which have heretofore been essentially double, now come single, and others ill-shaped and deformed, so that I should not know the sorts.

As regards crops, grass has come in remarkably well, and has been gathered. Rye and oats have been average crops so far as I am informed. Indian corn was promising until recently, and it is now believed that early planting will be likely to escape with little injury from the drought, while the late planting will be short and nearly entirely cut off, if the drought continues much longer. What is here said of corn is more emphatically true of potatoes, the late crops of which, it is feared, will be entirely destroyed. I have heard one man, who planted two acres of potatoes late, say that he should not get the seed. Among other reasons in favor of early planting, is the greater security against the effects of severe summer droughts, which often are so serious. Garden vegetables have come in well, and been abundant, but are now beginning to fail, or some of them, from the drought. It has been remarkably hot, as well as dry, during the last three weeks, which has increased the evil effects of the drought. In 1825, at the same season of the year, we had no rain for six weeks following the fourth of July; and in 1826 we had a drought in May and June, but have had unusually wet seasons since, until the present.

We shall have very little fruit in this section of the country; the frost the 14th of May was the most severe of any within the memory of man so late in the season. Apples, pears, peaches, plums, &c., were almost entirely cut off: of the two former some few escaped on the under limbs of the trees, but from the drought, or other cause, these seem to be falling off.

Grapes were also entirely cut off by the frost, but my Isabella vines threw out a second growth of buds, which will give me a handsome supply of grapes. My other vines also budded and blossomed the second time, but did not set so as to produce much fruit. In this respect, as in most others, the Isabella seems to exhibit a decided superiority over most other sorts.

I began merely to speak of the drought, but have written on to the end of the sheet.

Yours, &c., J. M. N.

Canada.—We are indebted to the Montreal Daily Advertiser, for the following interesting Agricultural Report for July.

The month of July has been extremely warm and dry throughout, with the exception of a few partial showers.

The wheat crop is generally good, and nearly at maturity. A small worm has appeared in the ear, destroying some of the grain; but I hope the injury is not extensive. The grain that is safe is so much better fed, fuller, and plumper, than usual, that it will more than compensate for the partial damage.

This year wheat is perfectly free from the most destructive disease, mildew; but not entirely so from smut. It is the generally received opinion, that the proximate cause of smut is the infection of the seed by the dust of the smut ball, and that by carefully washing the seed, and applying caustics, are the only means of prevention known at present; this farmers ought not to neglect.

The climate of Canada, on an average of years, is extremely favorable for the production of wheat,—so is the soil generally. Wheat, therefore, should be the species of grain that farmers should apply their attention to raise in all the perfection and abundance that is consistent with a proper rotation and distribution of the crops; but I must remind farmers, that it is only by observing a proper rotation and distribution of crops, with other good management of the soil, by pasturing, manuring, and summer fallow, that wheat can be produced either in abundance or perfection.

Barley has proved to be a most excellent crop, and is partly housed.

Oats sowed in good season will be abundant; but late sowed oats will be short in straw and grain.

Indian corn, that was of fair promise the 1st of July, has advanced rapidly, and, should the fall be favorable, will be a good crop.

Peas, on suitable soils, properly prepared, are a good crop.

Potatoes will not be so abundant as I expected, from the great extent cultivated, and their appearance the 1st of July. Late planted potatoes, if dry weather continues long, will be a bad crop. Potatoes to be produced in perfection and abundance require early planting, and rain occasionally.

Turnips on dry or strong soils cannot be good this year; and I am decidedly of opinion, that the climate of Canada is in every way unfavorable for their extensive cultivation. Turnips will only thrive in a cool and temperate climate, sufficiently moist. In proof of this, in Ireland turnips thrive better than in any part of the British Isles. I have seen there, a turnip cultivated in the field weigh forty-two pounds the first week of October.

Carrots look well this year, but are not extensively cultivated. On suitable soils, properly managed, they are a certain crop.

Hay has been well got in. The last month was as favorable for curing hay as could be desired. Where there is not sufficient barn room, hay will keep well in well-made stacks, thatched. I like to put it together in stacks before it becomes very dry, applying a reasonable quantity of salt, which prevents too great fermentation. I believe all descriptions of hay, clover particularly, better for fermenting moderately, from its own sap, or juice, (not from wet,) provided the fermentation do not proceed so far as to deprive it of its fragrant smell. While hay retains its sweet and fragrant smell, it is of no consequence that even the color should be changed by fermentation.

Pastures have suffered from the dry weather, and there is not at present appearance of much tattermath. Pastures in Canada will ever be subject to injury by drought, and this circumstance alone is, in my opinion, sufficient to prevent the profitable introduction of a large description of animals, *if there was no other cause.*

Dairy produce sells at moderate prices.

If some of our crops suffer this year by dry and warm weather, so necessary for bringing wheat, (by far our most important crop,) and barley, to the greatest perfection, we should not complain. Our hay—a most essential crop when the winters are long and severe—is abundant, and the greatest part secured in the very best order; our wheat good, and nearly at maturity; our barley good, and partly in the barns; our oats, sowed in time, excellent; our peas, when properly managed, good; and even our potatoes, that have suffered most from drought, where they have been planted in time, promise fair for a good crop. Truly, this is abundant cause of thankfulness for the husbandman, who, I have thought, is above all others highly favored—living always in the most healthful atmosphere, with the opportunity to be a constant spectator of the wonders, the beauties, and bounties of Nature, than which can there be any thing better calculated to delight the eye, and rejoice the heart? A good Providence each year renews his treasures, by causing "bread to spring out of the earth" abundantly, which now, as the fields grow yellow, invites him to prepare his sickle to cut down, and

collect for his future subsistence, free from all claims by the rapacious landlord or the insolent tax-collector. All that appears to me to be necessary to make him as happy as is consistent with our present state of existence, is that he shall be industrious, frugal, perfectly temperate, and duly grateful to the Giver of all good. WM. EVANS.

Cote St. Paul, August 1, 1834.

MONTHLY COMMERCIAL REPORT. — The month of July has been to the farmers a fortunate one: a favorable harvest was succeeded by peculiar circumstances, which enables those farmers who have facilities in getting their wheat to market early, to obtain higher prices than they anticipated. The first contracts made were at $1 15 per bushel, but a spirit of competition was excited among the millers, and particularly those whose new establishments are on an enormous scale, which, without any circumstances to warrant it, caused the price to be run up to $1 25 and even $1 30. The farmers wisely availed themselves of this excitement, which continued but for a few days, and during that short period most of the crops on or near James River and its tributary streams, were sold, or rather contracted for, deliverable at early periods. It is estimated that the extent of these operations exceeded half a million of bushels. But so soon as the millers tired of playing this losing game on each other, the price declined to $1 10 for red, and $1 15 for white wheat, which rates are now current. It is to be desired that this enterprising spirit may not result in loss to the millers, so that it may be cherished hereafter. Some cargoes of new wheat, which arrived at New-York, were sold there at $1 16, while $1 25 was paid in Richmond.

The capacity of the mills in Richmond and its immediate vicinity is adequate to the manufacturing of about 500,000 barrels of flour per annum, if it were practicable to keep them supplied with grain. The best markets for their flour are in South America, but only a moderate portion of so large a quantity can be required in those markets. As the season advances the price of wheat will probably decline, unless some European demand shall arise.

With the progress of the inspections the impression that the tobacco crop will prove deficient continues to gain ground, and the prices of such qualities as are suitable for shipment are well sustained. The lowest grade sells at $3 75 to $4 per 100 lbs.; good fine and choice descriptions at $8 to $12, $13, and $14. Foreign capitalists are believed to be largely interested in purchases of this article, as well as of cotton during the present year. They may thus exercise a controlling influence on the prices abroad, so long as the supply does not greatly exceed the demand; but when the article has passed out of their hands, their efforts will be directed to reduce its value, that they may renew their speculations, which have thus far this year been successful.

The cotton manufacturers in England and France have done a larger and more profitable business this year than heretofore, and while supplies from this country have increased, those from other sources are smaller than usual; prices have therefore been well supported. The manufacturing establishments in Virginia have, on the contrary, been very unprofitable this year, and those in the northern states have suffered under the same influence. The business in cotton may be considered closed for the season. The last sales were at 12¼ to 13¾ cents. The prospects for this and all other growing crops are reported to be favorable.—[Farmer's Register.]

Mr. Samuel Currie, gardener at Stanley Hall in the neighborhood of Wakefield, has lately left England with a view of establishing himself as a market-gardener at Washington, in the United States. We have no doubt of his ultimate success.—[Loudon's Mag.]

OBITUARY — *Charles R. Webster.* — This inestimable citizen died at Saratoga Springs, at two o'clock this morning, (July.) He had been ill for several weeks of a glandular affection, but was not supposed to be in immediate danger. Only a few minutes before his death, he was walking about his room. He was in his 72d year.

Mr. Webster was a native of Hartford, Ct., where he served his time as a printer, with the ancient house of Hudson and Goodwin. During the revolutionary war, he was associated in business with the venerable John Lang, of New-York.

In 1784, fifty years ago, Mr. Webster came to this city, and established the "Albany Gazette," at the head of which paper he remained for forty years. He was during this period extensively engaged in the printing, binding, and book-selling business. Having, as the appropriate reward for his diligence and economy, acquired an ample fortune, Mr. Webster committed the management of his extended business to his junior partners and kinsmen, and sought repose from a long season of untiring toil. And most eminently did he deserve both his fortune and its enjoyment, for his wealth had been acquired in a way alike honorable to himself and useful to his country.

We leave to the paper which Mr. Webster established, the grateful duty of paying that tribute which is due to his virtues and his memory.—[Albany Evening Journal.]

We had but a very slight acquaintance with Mr. Webster; sufficient, however, to receive a very favorable impression, particularly of his friendly disposition, gentlemanly conduct, and activity of mind. He took a deep interest in promoting agriculture, and was treasurer of the State Agricultural Society.

GRANT THORBURN.—Before this we should have noticed the retirement of Mr. Thorburn, from business. He has been successful—has reared an establishment creditable to himself; and very instrumental in promoting a taste for rural improvement in this country. His son and successor, Mr. G. C. Thorburn, will doubtless fully sustain the usefulness of the establishment.

The following, from the Commercial Advertiser, informs our readers where Mr. G. has located himself, and how he disposes of his time.

Hallett's Cove, July 12th, 1834.

MESSRS. EDITORS.—I am *most comfortably* employed, just to my *heart's content*, busy in writing my journal in a cool room—no one to *disturb* my *papers*, nor myself;—I have your paper every evening, too. When tired of writing and reading, and when a *cloud* comes between the sun and myself, I walk out with my hoe and kill weeds,* and when he hides his burning face behind the blue hills in Jersey, I again take the hoe and work, just enough to make sleep welcome as soon as I drop my head on the pillow. If the sun pours down a flood of fire, (as he did two days ago,) and I am tired of reading or writing, I light my pipe—(I beg pardon of these intemperate persons of some of the temperance societies, who make *smoking* a *church felony*,)—and walk to and fro in the large passage of a large old Dutch house, where the doors and the windows are so near the river, that I can pitch a biscuit into the water, and the breeze blows through the passage like the chaff before the wind on a threshing-floor. While retracing my late journey by sea and land, if I come to an article which I think may amuse yourselves, or friends, I will send you a copy. I am in such a delightful spot, and having for fifty years been carrying the world on my back, I feel that I have just pitched it off. We have a good Episcopal church within a quarter of a mile—and if they do read prayers, I feel pleased when I think that Hooker, Cranmer, and Hervey used the same words. The steamboat Fox stops four times a day, within one hundred feet of my door. At 8 A. M. I send my basket, and at half-past 10 it returns with my marketing.

Already many visitors come up from the city, (I would like to see any of you, by-the-bye,) and if Shaw and Thorburn live and do well, there will not be such a place of resort for many miles. Yours, G. THORBURN.

* Better kill weeds than kill time. The law ought to make it felony to *kill time* in a country like this, where weeds grow faster than potatoes. Every idle man of health ought to be compelled to take a hoe and go forth. He that won't *work* shan't *eat*, says religion and reason.

POTATOES IN ENGLAND.—*Mr. Fleet:* I yesterday refused to take in a number of the New-York Farmer and American Gardener's Magazine, as there was a charge of $2 upon it. I regret that no means can be devised for obtaining them at a reasonable sum. The number which I received last was for March, 1834, and the charge was sixpence; it was brought by the John O'Gaunt steamer, from Liverpool.

The potato crop, I find, since my last letter was sent off, turns out worse than was expected, and many of the farmers are now reploughing the land for replanting their potatoes; the cause of the failure baffles both the learned and the unlearned.

My crop has not failed, and is considered the finest in this part. They were planted early in May; the land was covered with horse and cow dung, and then drills made with a plough; the sets being newly cut and large, and put in as the plough went on, having plenty of hands to keep the plough going. It appears that potatoes being cut into sets a week or ten days before planting, have failed. I will just mention one instance of a farmer having planted one day about three acres, but not being able to finish the whole of the field that day, the remainder was not planted for ten days, and those have completely failed. This I think is a proof that the potatoes should not be cut till they are set; and it has been found that, on examining the ground near the fall, where the potato set is found, the decay commences on the cut side, and not on the skin side, and that a number of small insects are found, resembling small tape worms, devouring the matter in the set. From the public papers it appears that experiment has been made this year in planting the potatoes whole, and not cutting them, which appears to have answered, for the same sort of potatoes having been cut into sets and planted in the same field, at the same time, have failed. Perhaps some of your readers will be able to make a few remarks on this communication.

Yours, &c., M. SAUL.

Lancaster, England, June 22, 1834.

EMIGRATION.—H. A. S Dearborn, of Roxbury, is about to remove from Massachusetts to the great and fertile State of Illinois. "Not he alone." "There is a tide in the affairs" of emigration, and at the time of this present writing, it is setting with a strong current towards that beautiful State. We hear of families in every direction, who are packing up their goods and chattels for Illinois. A large number will start from Middleboro' and Duxbury about the 15th of September next, who are to be joined by other families in the city of New-York.

RENSSELAER AGRICULTURAL SOCIETY.--We hope all those who take an interest in county agricultural societies, will persevere and work while the day lasts; or, like the chairman to the following circular, they will soon have ended their career of usefulness.

The Executive Committee of the Rensselaer Agricultural Society hereby give notice that the Annual Meeting for the election of officers will be holden at the Court House, in the city of Troy, on the *first Tuesday in October*, at one o'clock, P. M., when an address will be delivered by Mr. S. BLYDENBURGH, on the improvements of which Agriculture is susceptible, and the importance of those improvements, both to individuals and to the public.

Taking into consideration the infant state of the Society, the present limited number of its members, and the deficiency of its funds, the Committee have come to the conclusion that it would be inexpedient to attempt a general Exhibition and Fair the ensuing fall; but they confidently hope, that those who wish to encourage the Institution will renew and continue their exertions to increase its numbers, augment its funds, and insure its perpetuity.

Any person wishing to become a member of this Association, previous to the above meeting, may do so without the formality of initiation, by sending his name, with one dollar, to our Treasurer, Mr. Alexander Walsh, of Lansingburgh.

The Committee are much gratified in believing that, even in the little beginning which has been made, some good has already resulted from the efforts of the Society, in awakening a spirit of inquiry, and diffusing useful knowledge. The subject is more important to mankind than any other of an earthly nature. Its magnitude is beyond the reach of individual enterprize, and can only be developed by the united efforts and effects of associated industry, wealth, and talent. In this way much has already been effected, but we trust this is but a prelude to what still remains to be done. The Committee will solicit the attendance not only of farmers, but of all who feel the importance of improvements in agriculture, horticulture, and the household arts.

The reports of committees from districts and local fairs will be thankfully received; and also, accounts of remarkable results in agriculture. By order of the Committee.

E. C. GENET, Chairman.
JOHN JAY VIELE, Sec'y pro tem.
Lansingburgh, July 3d, 1834.

PENNSYLVANIA HORTICULTURAL SOCIETY.—If the lovers of vegetable nature, in and about New-York, will send on to Philadelphia a respectable delegation, we will insure them as good a cold cut, as excellent wine, and perhaps as cordial hospitality, as were given to the tickled Whigs.

SIR,—Will you be good enough to insert in your columns a notice of the intended exhibition of the Pennsylvania Horticultural Society, on *Wednesday and Thursday the 17th and 18th of September*. Also, that the Society solicit contributions in fine specimens of fruit, flowers, or culinary vegetables.

Your obedient servant,
CHARLES PICKERING, Rec. Sec'y.
Philadelphia, August 6th, 1834.

THE VALUE OF GREEN VEGETABLES AS MANURE was strikingly proved by me in the spring of 1833. I had a trench opened of sufficient length to receive six sets of potatoes; under three of these sets I placed green cabbage leaves, but the other three had nothing but the soil. When the crop was dug up, the plants over the cabbage leaves yielded about double the produce of the others. J. D. PARKS. —Dartford Nursery, January, 1834.

On the discovery of green sand in the calcareous deposite of Eastern Virginia, and on the probable existence of this substance in extensive beds near the western limits of our ordinary Marl.

[We wish professors in colleges would follow the example of Professor Rogers, in making themselves known and useful to farmers. They will thus not only accomplish much good in promoting the interest of agriculture, but will endear themselves to the community, and render their office more popular.—ED.]

William and Mary College, June 26, 1834.

To the Editor of the Farmers' Register.

Since my attention was drawn to the nature and properties of the New-Jersey green sand, by the specimens which you sent me for analysis, and by our more recent conversations on the subject, I have made a visit to the region in which it is found, and have witnessed the most striking evidences of its utility as a manure. During this excursion, I examined the marl in all its varieties, and learned many interesting particulars respecting its use, from intelligent farmers, long experienced in applying it to the soil. I have moreover analyzed several specimens collected on the spot, with the view, if possible, of throwing some light upon its agency when applied to the soil.

Since my return, I have made diligent search for this substance in our marl beds and the accompanying strata, and am at present directing my inquiries to that region of Lower Virginia in which, according to geological laws, as well as from some indications of which I have heard, this deposite may reasonably be expected to occur. As far as relates to the marl beds of this vicinity, my search has been unexpectedly successful. With scarce a single exception, I have discovered particles of the green sand, mingled with the ordinary sand, clay, and shells; and in some instances, in so large a proportion as no doubt greatly to enhance the useful agency of the calcareous matter. Indeed, I am inclined to believe that, in some cases, the agricultural efficacy of the marl is chiefly owing to the green sand which it contains. In this conclusion I think I shall be sustained by facts hereafter to be noticed.

The general occurrence of this substance in our marl beds is certainly a discovery of some interest; and though I may perhaps exaggerate its importance in a practical point of view, I cannot but think that it is worthy of the attention of our farmers. I speak of its *general* occurrence, because, although I have examined but few specimens from a distance, the general resemblance of our marl deposite throughout, together with the almost invariable presence of the green particles in such as I have inspected, would seem to justify the conclusion that it is a usual accompaniment of our marl formation, though by no means in equal proportions in all localities. Out of more than forty specimens which I have examined, there were only two in which the green particles could not be discovered; and as they frequently occur in patches, and not generally diffused throughout the bed, it is probable that even in the beds from which these two specimens were procured, the green sand might be elsewhere found. Some of the most efficient marles in the neighborhood of Williamsburg contain a marked proportion of this substance. At Burwell's Mill, (three miles below the city, towards Yorktown,) the intermixture is so large, that the sand and *detritus* of shells washed down by the spring freshet display a very distinct greenish olive tinge, which even travellers observe as they pass through the valley in which the deposite exists. At this place, the shells, as they are taken out of the extensive bank recently exposed by the torrent, are frequently filled with a dark mass, containing as much as thirty per cent. of the green particles. In fact, the whole bank is strongly tinged by them, and the stratum which overlies the shells, in some places five feet in thickness, is precisely similar to some of the poorer deposites in New-Jersey, and contains upwards of thirty per cent. of this substance. In Judge Semple's marl beds in the same vicinity, the green particles are equally abundant—and, as in the former case, extend into the incumbent stratum of non-calcareous matter. In many instances, this layer of overlying earth has been found even more efficacious on the soil than the subjacent marl—a fact which might naturally be inferred, when the green particles abound chiefly in the upper stratum, from the extraordinary efficiency of the green sand as experienced in New-Jersey. But by far the most interesting locality of this substance in point of extent, which I have examined, occurs on the shore of James river, adjacent to King's Mill and Littletown. Here the banks rise perpendicularly to the height of from forty to sixty feet, and for about three-fourths of this elevation are composed of shells and earth mingled with a large proportion of the green sand, which in some places imparts a distinct color to the surface. The sand of the beach is also filled with these particles which the rains have washed down, and which, at first view, present the appearance of the common black sand of our river, though in much larger quantity. At Bellefield, and other places on the York river, the banks and beach are similarly impregnated.

The green particles may be readily recognised by their want of lustre, the ease with which they may be bruised with the point of a penknife, and the bright green stain which they then produce. In examining earth or marl in which they are very sparsely scattered, the particles are sometimes difficult to separate from the other matter. My method is to moisten the end of the knife blade by applying it to the tongue, and then to remove several of the particles by adhesion. When placed upon a card and bruized, they leave a brilliant stain. This test may be confidently relied on.

The occurrence of the green sand so extensively through our marl region, affords strong grounds for hoping that valuable beds of this substance, like those of New-Jersey, almost entirely unmingled with other matters, may be brought to light by a judicious and enterprising examination of the district on the western limits of our marl. And should such a discovery be made, the agriculture of Lower Virginia would become possessed of a new and powerful auxiliary in furthering its already rapid career of amelioration. Even the fact that the green sand often exists in considerable quantities in and above our ordinary marl beds, which is I think now sufficiently established, may furnish no unimportant aid in the improvement of our lands, by leading to a more varied and judicious adaptation in the application of our manures.

Independently of the existence of the green sand in a scattered state in our calcareous strata, there are other and stronger reasons for believing that a deposite similar to that in New-Jersey will be found in the appropriate region. In a geological arrangement of our various formations, the marl beds of Eastern Virginia and Carolina, as well as those of Maryland, belong to a later period in the physical history of our country, than the green sand formation of New-Jersey—the former being referred to the tertiary, and the latter to the secondary epoch of geologists. Now this tertiary deposite extends into New-Jersey, and is found in many places in the latter state nearly contiguous to the green sand. Moreover, indications of the New-Jersey formation have been found in Maryland—and such is the general regularity with which the different geological deposites are arranged, that we may fairly infer the existence in Eastern

Virginia of the green sand, or some deposite equivalent in a geological point of view—though at the same time it by no means follows that the green sand, if actually found, would be sufficiently near the surface to render it extensively available as a manure. The object however is of such magnitude, as to justify a very diligent examination, and I am therefore desirous of enlisting in this research all those readers of the Register who reside in the region which has been alluded to before. As however the success of this investigation will be generally promoted by an acquaintance with the indications by which the green sand, or its geological equivalents, are to be recognised, and some knowledge of the properties and constitution of the substance itself, I shall here give a brief account of the New-Jersey formation which I visited, together with the result of several chemical analysis of the sand, carefully executed by myself and others: and further to interest your readers in this important inquiry, I shall add a statement of such facts bearing upon the application and agency of the marl, as I was enabled to collect during my visit to the beautiful region which it has so largely contributed to fertilize and adorn.

The New-Jersey green sand is apparently identical with that series of deposites recognised in Europe by the name of the green sand formation, characterised by a predominance of minute green particles in many of its strata. In Europe these strata are generally found alternating with beds of chalk; but in this country no chalk is found, unless in the region west of the Mississippi. The fossils embedded in the green sand, on both sides of the Atlantic, are however so strictly alike, that the geological equivalence of the American and European beds can scarcely admit of question; and is therefore generally conceded as an established point. It is relevant here to remark, that in tracing cotemporaneous or equivalent geological formations in different regions, geologists are accustomed to rely almost exclusively upon the fossils, whether shells, bones, or vegetable remains, which the strata may contain—a procedure to which they have been led by the whole tenor of modern developements in geology. Now, with reference to the New-Jersey formation, though it would be impossible without numerous drawings, and much descriptive matter, uninteresting to general readers, to convey a knowledge of even the principal shells and other fossils existing in the green sand, some account of a few of these fossils may possibly be useful in the inquiries which I trust many of your readers will be prompted to undertake.

1st. *Lignite*, or carbonized wood, often associated with iron pyrites of a bright yellow lustre, frequently occurs in the beds overlying the green sand formation, though it sometimes occurs in other situations.

2nd. *Amber* is often found in a similar position, as was the case at the Delaware and Chesapeake Canal.

3d. *Belemnites*—a fossil of a yellow or brown color, in shape somewhat like a cigar, but rather thicker—very brittle, and usually found broken transversely, so as to exhibit its tubular character within.

4th. *Ammonites*—a fossil presenting the appearance of a snake coiled up in a flat coil, and frequently large and ponderous.

5th. The *Echinus*, or Sea Urchin—sometimes globular, at other times much flattened, having numerous little warty prominences, and minute perforations symmetrically arranged on its surface, and when entire, occasionally furnished with spines or prickles.

6th. *Gryphæa*—a shell having one valve very deep and convex, and the other flat. It somewhat resembles the small shell (chama) very abundantly found in our marl beds. This latter is smaller, has a rougher exterior, and has two muscular impressions in each valve—whereas the Gryphæa has but one.

7th. *Exogyra*—a shell like the former, with one convex and one flat valve—but a great deal rougher and more irregular in aspect, and of large dimensions.

8th. The *Falcated Oyster*—a beautiful shell, about one and a half or two inches in length, and bent like a Turkish scimetar.

These rude descriptions, which have no pretensions to scientific accuracy, are designed to draw attention to such fossils as may be brought to light in the region in which the green sand may be expected to occur—and in this point of view may prove of real value in examining for that deposite. Of course a scientific inspection of the fossils would be necessary to establish their identity, but this can readily be produced by transmitting them to the Academy of Sciences in Philadelphia, or by sending them to William and Mary, where they would be carefully examined and compared with the New-Jersey fossils as collected and described. Indeed, there is reason to believe that some of the characteristic fossils have already been found in Eastern Virginia. A bed of Lignite has been lately discovered on the Rappahannock, a few miles below Fredericksburg, the very point at which it might be expected to appear, and from information recently received, I am disposed to believe that Belemnites may be found near the mouth of Potomac Creek. It has been said also that the Gryphæa has been found, but I have not heard in what vicinity. These facts should furnish an additional stimulus to inquiry, and literally no stone should be left unturned in pursuit of so important a discovery.

The New-Jersey green sand is generally found in the valley and meadows, though occasionally it rises to some height in the surrounding hills. Its depth in many places is very great, and several strata occur, separated by layers of shells, or blue clay, or sand colored by iron. The general aspect of the green sand is that of a bank of moist bluish clay—though in some places the green tint is very perceptible. This however only occurs where the earth is dry. When thrown into heaps by the side of the pit, the mass falls into a coarse powder, in texture and color very closely resembling gunpowder, on which account it is very commonly known by the name of *gunpowder marl*. This mass consists in very large proportion of the pure green sand, having a slight admixture of clay, and in many places of minute fragments of shells. Occasionally, the bank presents a mass of the pure green sand itself—and again, in some places the shells predominate. In one of the beds in the vicinity of New-Egypt, I discovered small spiculæ of gypsum, or sulphate of lime—but this occurred at no other locality; and in this place the crystals were so minute and few in number as to require the use of a microscope to be seen distinctly. The moist marl when warmed in the hand exhales a strong phosphoric odor, a fact which I believe has not been hitherto remarked.

As already observed, the marl frequently contains shells both in an entire and broken condition. This however is by no means universal. In fact, the great majority of those beds in actual use contain either no calcareous matter, or a very minute proportion of it. This I ascertained by chemical examination. In the vicinity of Arney's Town, Crosswicks Creek, and Shrewsbury, as well as other places, much of the marl which the farmers spread over their land contains no carbonate of lime; while at New-Egypt the calcareous and non-calcareous marls are both extensively employed. The same is true, likewise, of the beds farther south, at Mullica Hill. The green particles themselves have an invariable composition—and those of our Virginia marl beds are perfectly identical with those of the New-Jersey deposite. Thirty grains of the green sand yielded by careful analysis—

Silica,	15.51 grs.
Protoxide of iron,	7.56 "
Potash,	3.10 "
Water,	3.00 "
Magnesia, a trace.	

These results agree very closely with the determination of Berthier of France, and Seybert of Philadelphia. The former operated upon the green sand of Europe, the latter upon that of New-Jersey. It appears therefore that the predominant constituents are silica and oxide of iron. The potash, amounting to about ten per cent. is most probably the ingredient chiefly concerned in the agricultural agency of the marl, though in what way its connection with the other ingredients is severed, when the marl is spread upon the land, I am at a loss to conjecture.

Throughout all the district in which this deposite occurs, it is extensively employed in agriculture. In the neighborhood of Arney's Town, one of the points which I visited, it has been used as a manure for the last thirty years—but its general introduction is of more recent date. In the region in which the marl chiefly abounds, the soil is loamy, having in some places a large intermixture of tenacious clay. East of this tract, which is a narrow band nearly parallel to the Delaware river, the country assumes an appearance very similar to that of the sandy lands of Eastern Virginia, covered with a thick growth of pine, and comparatively unproductive. On both these varieties of soil the green sand is continually used with the most striking benefit. For the clay soils, the more sandy marls are of course preferred; and for the sandy soils, those which contain some clay along with the marl. The proportion in common use near Arney's Town is from ten to twenty loads per acre; in other places five loads, or even less, is found to be sufficient. The action of the marl appears to be very permanent, as will be evinced by the following sentiment. In a large quadrangular field over which I walked, four successive applications of the marl had been made at intervals of four years—commencing about twenty years ago. The first dressing was applied to the north side, the second to the south, the third to the east, and the fourth to the west—while a small space in the centre was left without any marl. All four sides were covered with a very heavy crop of clover, which was nearly, if not quite, as luxuriant on the north as either of the other sides—while the space in the middle was almost bare. The action of the marl appears to be most powerfully felt by clover and grass—but it is very conspicuous also with small grain and corn. A very intelligent farmer told me that it more than tripled his clover and grass crop, and doubled his small grain. In general, it is spread upon the clover every fourth year, and ploughed in for the next crop. That it is very efficient upon sandy soils is evinced by the following striking fact. Some years ago an enterprising farmer, near New-Egypt, purchased two hundred acres of the Pine Barren, which, by marling, he has converted into pasture sufficient for one hundred head of cattle. Such is the demand for the marl, even at a considerable distance, that it has become an article of great profit to the proprietors of the pits, and more than one individual was pointed out to me who had risen to wealth by the sale of marl.

From what has been stated it will at once be evident, that the discovery of extensive and accessible beds of this manure in Virginia would be a most important accession to the resources of the state, and that an active and diligent search ought forthwith to be commenced throughout all the region in which there is a probability that it exists. Every aid which it is in my power to give, will be cheerfully bestowed in furtherance of this inquiry: and as I feel the double interest of a scientific curiosity, and a sincere solicitude for the agricultural posterity of our state, I shall

gladly receive all fossils and other specimens which may be transmitted for inspection or analysis, giving them a prompt attention, and communicating in reply such hints as may promise to be most useful in this deeply interesting and important investigation.

WM. B. ROGERS.

CULTURE OF WHEAT. *To the Farmers of Massachusetts.*—The subscriber, for public reasons, being desirous of information in respect to the culture of wheat in Massachusetts the present year, requests of farmers, who may have grown any, the results of their cultivation and experience, particularly as to the following points.

1. The amount of crop.
2. The extent of land sown.
3. The quantity of seed to an acre, and preparation of the seed.
4. The kind of wheat; whether winter or spring grain; bald or bearded; where obtained; by what name designated; average weight per bushel.
5. The condition of the land; whether newly cleared; burnt; swarded; or how used for two or three years previous.
6. How prepared for the crop; amount and kind of manure; use of lime, plaister, or any compost manure.
7. The time of sowing; week and day, if possible to be ascertained.
8. The diseases or accidents, if any; whether affected by rust, smut, or mildew; and any circumstances of weather, situation, or particular condition of the plant, connected or contemporaneous with such occurrence.
9. The situation or exposure of any blighted field, whether high and airy, or low, damp, and confined.
10. Whether or not supposed to be affected by the vicinity of barberry bushes.
11. Whether or not attacked by the Hessian fly or other insects; whether winter killed or not; and how affected by the snow.
12. The time and state of cutting, and whether, in their opinion, early or late cutting be preferable.
13. He requests likewise the opinion of farmers as to the extirpation of weeds particularly injurious to the wheat crop; such as tares, cockle, chess, and the Canada thistle; and information of any method or machinery by which the grain may be cleansed of 'foul stuff.'
14. The mode of threshing; and the best threshing machine in use; the power required for it; its capacity and cost.
15. The experience of farmers as to the cultivation of wheat crops successively on the same land; and in sowing clover with the wheat, with a view to ploughing it in for a succeeding crop; and whether customarily ploughed in with the stubble; or otherwise depastured or mowed for one or two years.
16. He would be glad likewise of the opinions of farmers as to the value of a wheat crop compared with other crops; the average yield; the capacity of the state to furnish its own wheaten bread; the particular reasons why, in any part of the country, the cultivation of wheat has been abandoned; any suggestions, from their actual observation and experience, connected with this subject; and some general estimate of the amount and use of imported flour consumed in any village, town or county.

As the subject is of great importance, and as his views are wholly of a public nature, the subscriber confidently asks the aid of the farming community and of his agricultural friends throughout Massachusetts in obtaining this information. He solicits likewise a similar favor from his intelligent correspondents in the State of New-York, the magnificent empire of wheat.

Communications on this subject, addressed to the subscriber, may be handed to the members of Congress in the respective districts in Massachusetts, who are respectfully requested to interest themselves in this subject, and to have the goodness to transmit any such communications as per direction; or they may be sent by private conveyance to the New-England Farmer office, Boston; if any from New-York, to the Hon. Jesse Buel at Albany; or they may be addressed by mail, (postage paid,) to the subscriber, at Meadowbanks, near Greenfield, Mass., who promises to put the agricultural public in possession of any valuable information which may in this way be obtained.

HENRY COLMAN.

July 28, 1834.

FREQUENT PLOUGHING FOR FALL CROPS.—If the principles contained in the excellent article on fallowing, on pages 242 and 274, are correct, farmers will see some additional reason for increasing the number of ploughings for their wheat and rye. This frequent stirring of the soil will bring every portion of it more into contact with the air, and thus become a sort of an expeditious fallowing. It is very probable that the chemical action of the air on the soil is not deep, and is performed in comparatively short time—only a very few alternations of sun, dew, and rain. If this is the case, then four or five ploughings or harrowings, performed within some fifteen or thirty days immediately preceding the sowing, may be better than an entire summer fallow with a less number of ploughings. We hope some of our readers will try experiments in reference to this subject. We have known farmers to give their wheat grounds several stirrings at once; but it would seem, on the principles of Professor Rennie, that one of the principal objects in frequent stirring could not thus be fully obtained.

HOEING TURNIPS.—The following drawings represent the forms of a turnip hoe. The one,

with a handle, and coming to a point, is used when the seed is sown broadcast; the other when the turnip is sown in drills. This is made of steel, and eight inches long, and about two and a half wide, or high. Of the latter kind, however, some use them of less length.

As soon as the turnips are one or two inches high, the hoeing should commence; and on the faithfulness and frequency with which it is done depends, in a very great measure, the obtaining a large crop.

MR. BLAMIRE'S EXTENSIVE SALE OF STOCK.—The recent sale of stock, &c., belonging to W. Blamire, Esq., M. P., was the largest sale that ever took place in the county of Cumberland, and was also the most numerously attended. Early in the day the roads in almost all directions leading to Gaitsgill, were thronged with people making towards the sale, which commenced between ten and eleven o'clock. There were, it is computed, upwards of 3000 persons present, many of them from a considerable distance. The arrangements were so well contrived, and every thing conducted with so much regularity, that not the slightest confusion took place. A ring, of about thirty yards diameter, was strongly done about with posts and double rails; behind which, at the distance of about six feet, were two rows of planks, one a little elevated above the other, the lower about a foot from the ground, and which were densely crowded from end to end. The space between the planks and rails was also occupied by a great number standing on the ground. A large quantity of substantial viands was prepared for the refreshment of the company, of which all might partake that were inclined. Legs of veal, hams, rounds of beef, &c. &c., disappeared in rapid succession, and in the vanquishing of which some performed prodigies of valor. Provision was made for a large attendance, but so much was the influx greater than expected that there was far from sufficient on the first day. On the second day the attendance was comparatively small, and, of course, they fared the better. The cattle were in a field adjoining, which was connected with the ring by a space strongly fenced off on each side, along which the cattle were conducted, and admitted into the ring according to the number in the catalogue. As soon as the auctioneer had knocked down one lot, it was immediately driven out by an opening in the opposite side, and another brought in, so that the sale of the second was commenced almost before the other had quitted the ring. The auctioneer, (M. Armstrong, to whom great credit is due for the manner in which he performed his part of the business,) was thus kept perpetually employed, and the sale went on with great rapidity. The sale, like all public auctions, was various, some lots being much dearer than others, but, upon the whole, it was considered high. The price of the fat cattle ranged from £9 to £22. Two fat Highland bullocks attracted particular attention, and were knocked down at £63. The price of the calving heifers varied from ten to twenty guineas. Lots 52, 74, and 113, none of which were very strong heifers, were sold, the first for £19 5s., the second for £21 5s., and the third for £20. The advance upon stock of all kinds could not average less than 20 per cent. Many articles which were purchased within the last few weeks were sold at an incredible advance. A number of sheep which were purchased within a few days of the sale for 23s. 6d. sold at the auction for 33s. 6d.; and cows which were bought for about £14, sold for 20 guineas. Two fat Sutherland bullocks, which had been valued at £20 to £21 each, sold for £31 10s. each. Even the lean stock, (much of which was in very poor condition,) sold at incredible prices. There were about 300 head of cattle in all; but we understand not a few of the goods sold belonged to neighboring farmers.—[New Farmer's Journal.]

PRICES OF IMPROVED SHORT-HORN CATTLE IN ENGLAND.—At the Rev. H. Berry's fourth sale of improved short-horns, on the 11th February, 1834, the following prices were obtained:

Lot 1.	2 years old,	£24	3	0
2.	Ditto.	36	15	0
3.	Ditto. Bought in. £45 bid			
4.	3 years, do. do.			
3.	3 years,	29	18	0
6.	Calf, sold with the above.			
7.	3 years,	30	9	0
8.	3 years,	38	17	0
9.	8 years,	32	12	0
10.	9 years,	26	5	0
11.	Heifer calf,	15	15	0
12.	10 years,	36	15	0
13.	10 years,	48	6	0
14.	2 years old bull,	39	18	0
15.	1 year old ditto,	45	3	0
16.	Bull calf,	15	15	0
17.	Ditto,	31	10	0
18.	Ditto, 9 weeks old,	32	11	0

[British Farmer's Magazine.]

INTERCOURSE WITH THE WORLD.—Increasing our connections with mankind is like an extended line of an army, vulnerable at many points, and liable to be broken and discomfited. If we concentrate and incastellate our forces, we may, indeed, remain undisturbed, and we may also lose all in a coup-de-main. Alas! how dark is the ken of human foresight.

VIRTUES.—Human excellencies are like what we see of the stars, merely small specks of light coming from objects beyond the sphere of this world.

LAYING DOWN GRASS LAND.—In the 3d volume of the Memoirs of the Board of Agriculture of the State of New-York, we find an article by S. De Witt, Esq. of Albany, from which we extract the following.

There, in Great Britain, we are taught, that in order to have good pastures or meadows, no pains or expense must be spared to enrich the soil, where that is needed, to destroy as far as possible by a suitable course of husbandry every weed or plant that previously occupied the field; to have the ground perfectly pulverised by ploughing and harrowing, and then to sow on it a plentiful quantity of grass seed suited to the soil, and of those kinds which have been proved to be the best for those purposes. The fault I mean to find with our practice contrasted with that of the English is this—for pasture or meadow we sow in the spring of the year, on a field of winter grain, a small quantity of grass seed, from which we expect our future pastures and meadows, and trust to their branching out in two or three years so as to make tolerable pastures or meadows. In the meanwhile other grasses and weeds spring up so as to occupy most of the ground; and this is most notoriously the case in our new country, where the seeds of thousands of varieties of plants lie in the ground ready to spring up and overcome the growth of artificial grasses. In order to prevent this, the English practice before described is the more necessary here. The aboriginal weeds must first be destroyed by preceding crops, especially by those which require the use of the hoe, and then such a quantity of clean well selected grass seeds must be sown as will cleverly fill the ground and in their growth smother every other vegetable. For this purpose too much seed cannot be put in the ground at once. The practice of putting a small quantity of grass seed on ground laid down for pastures or meadows is one of the greatest errors in the husbandry of our country. On this subject I wish that our farmers would consult a book published in London, called the Complete Grazier. It gives recipes for the kinds and quantities of seed per acre proper to be sown on all the varieties of soils, such as clay, loam, sand, chalk, peats, up-lands, mid-lands, low-lands.

As a sample I will copy the recipe for an acre for low-land: meadow fox-tail 2 pecks, meadow fescue 2 pecks, rough-stalked poa 2 pecks, ray grass 1 peck, vernal grass 1 quart, white clover 2 quarts, marl grass 2 quarts, rib grass 2 quarts.

In the recipes for the various soils, the quantity of seed is generally about a bushel per acre. Let this be compared with our practice.

Here it is proper to be observed, that in laying down grounds for pasture lands, the English select the seeds of such grasses as will come to maturity in succession; but I think they carry this scheme to excess, and that there is no necessity for a mixture of such a variety of seeds to be used for these purposes. In our country the most esteemed grasses are white and red clover, timothy or herd's grass, the red top, and foul meadow. With these some other indigenous grasses intermix, the merits of which deserve to be investigated. Our best grasses for meadows are unquestionably the timothy, the red top, and foul meadow. The merits of this last mentioned grass are not generally known, and I suspect it to be the best, for low alluvial soils, to be found in our country. It appears to me to be a variety of the red top, Agrostis vulgaris, and preferable to it, being more delicate in its structure, and having leaves more slender, longer, and in greater abundance. I have been told by an acquaintance from Orange county, that it is chiefly used on the reclaimed drowned lands there, and preferred to all other grasses, and that it yields most abundant crops. I know from my own observation for a number of years, that without any artificial preparation it has gradually supplanted the coarse aquatic grasses on the lower parts of the low-lands at Ithaca. There can be no better hay than that which is made of it. On a rich moist soil, it will grow uncommonly dense, and I should think would yield as much from an acre as any other of the best cultivated grasses.

In order to make a good meadow on a rich soil I would recommend this practice. Destroy all the weeds and natural grasses by ploughing, harrowing, and suitable crops. Prepare the ground by sufficiently pulverizing it, and then sow on it so much timothy seed as that the growth from it shall immediately cover the ground, at least as thick as a field of flax. This then will give you a clear abundant crop of timothy to the exclusion of every other grass. Or if the ground be inclined to moisture, use foul meadow seed in the same manner; or make use of a mixture of timothy and foul meadow; at all events be not sparing of seed, and immediate abundant crops will be the reward. Timothy and foul meadow or red top, I consider as the best of all grasses for our low-land meadows, and the more every other kind is kept out of them the better. Some of the English grasses may be advantageously used in laying down permanent pasture grounds; but white clover and timothy are the best in use among us. Red clover is to be preferred for soiling and enriching the ground, when fallowing is intended. By means of it, with the assistance of gypsum, the poorest soils can be made valuable.

I have said that too much seed cannot be put into the ground at once. Every body knows what a small quantity is generally used, and how long it is before lands laid down as pastures or meadows come to perfection, and how they are injured by grasses of spontaneous growth which ought not to be there; but for which the greater part of the surface of the ground is left by the stingy sower. In confirmation of the propriety of these remarks, I will make further quotations from the Complete Grazier.

"The following proportions were sown a few years since by the Earl of Darlington: white or Dutch clover 17 lbs., clean hay seed 14 bushels, rib grass 1½ lbs., trefoil 1½ lbs. By which means (the soil being previously ploughed very fine and made perfectly level,) the land was speedily covered with a thick and excellent herbage. The only exceptionable thing in this practice is the quantity of seed, which is certainly too large for a statute acre."

The last remark, I presume, means an unnecessary waste of seed, not that the quantity used was an injury to the production of the field.

"Mr. Dalton's mode of laying down land to grass, is to make the ground perfectly smooth and level, and then sow upon every acre the following seeds, viz.: hay seeds 6 bushels, rib grass 12 lbs., white or Dutch clover 8 lbs., burnet 5 lbs. He manures it with a compost of earth, dung and ashes, thoroughly mixed together, and folds his sheep upon it, &c. The proportion of seed, however, is still too great, though in other respects his management be excellent.

"In the laying down of land for the purpose of forming a good meadow, greatly superior to the generality of pastures, the late Mr. Curtis recommends the following grasses, and two species of clover, to be mixed in the following proportions: meadow fescue grass 1 pint, meadow fox-tail grass 1 pint, rough tailed meadow grass ½ pint, smooth-stalked meadow grass ½ pint, crested dog's tail ½ pint, sweet scented spring grass ½ pint, white or Dutch clover ½ pint, common or red clover ½ pint.

"These are to be mixed together, and about three bushels sown on an acre."

Such appears to be the practice where agriculture has been growing towards perfection, aided by all the efforts of man, and the acquisitions of science and experience assiduously and constantly applied for its amelioration, for more than a thousand years. Now let the practice in our country be considered. With the reflection of this light on it, how most wretched does it appear!

How far the grasses of Europe are proper for our country, experience must decide. We know that one of our best grasses, timothy or herds' grass, cannot be cultivated to advantage in England, and sufficient experiments have not been made, or, if made, not recorded, to ascertain which of the English grasses would be an acquisition in our practice of husbandry. Nor have the proper researches yet been made to our pasturages and meadows, by the introduction of the grasses on which our cattle subsist in their ranges in our forests. For this purpose I would advise, that a botanist should turn a horse or cow, not starved, but with an appetite rather sated, into the woods at a proper season of the year, and observe the grasses which the animal would select for his food. By this means some might be discovered which would make valuable additions to those used with us for our pastures or meadows.

LOSS OF CATTLE BY DISEASE.—A writer in the Edinburgh Quarterly Journal of Agriculture, in advocating veterinary schools, sets the subject in the following light.

According to Mr. Colquhoun's estimate, there were in the United Kingdom, so long ago as 1812, 1,800,000 horses, 10,000,000 horned cattle, 42,000,000 sheep and lambs.

There are no tables published of sickness and mortality amongst quadrupeds; but out of 53,000,000, the deaths occasioned by diseases in the course of a year must amount to an enormous total. In Holland, above 500,000 cattle are known to have died of diseases within 20 years. At £10 a-piece, this would come to £250,000 a-year. The tenth part of one year's loss upon this article of cows alone, would be enough to put into operation throughout the whole kingdom, schools, which would create ten times as much wealth annually as was ever lost by the death of cows. If money laid out in diffusing knowledge produced a return of only one hundred-fold, it would be certainly an eligible investment; but a hundred-fold would be little, compared with its eventual products.

The Practice of Fallowing, of Paring and Burning, of Irrigation, and of Draining, explained on New Scientific Principles. By JAMES RENNIE, A. M. Professor of Zoology, King's College, London.

(Continued from page 244.)

Paring and Burning.—Upon the basis of my six preliminary facts, I am disposed to look upon paring and burning, as well as heath burning, in the light of an instantaneous fallow; a similar effect upon the excrementitious matter contained in the soil being rapidly produced by fire to that slowly produced by exposure to the sun's light in the process of fallowing. There are, besides, as in the case of fallowing, other secondary and subordinate effects (though hitherto considered the principal) that will come to be noticed as we proceed.

The practice of paring and burning appears to be as ancient as that of fallowing; and Virgil, who mentions it, is moreover not far from the truth in one of his explanations of its effects.

Oft, too, it has been gainful found to burn
The barren fields with stubble's crackling flames.
Whether from thence they secret strength receive,
And richer nutriment; or by the fire
All latent mischief and redundant juice
Oozing sweats off; or whether the same heat
Opens the hidden pores, that new supplies
Of moisture may refresh the recent blades;
Or hardens more, and with astringent force
Closes the gaping veins; lest drizzling showers
Should soak too deep, or the sun's parching rays,
Or Boreas' piercing cold, should dry the glebe.

[Trapp's Virg. Georg. i. 125.]

It has probably been more or less practised from the times of the ancients, though it does not seem to have been a prominent process during very early times in England, if I may judge from the following notice of it by Switzer, in his "Compendious Method," 8vo., 1729, now before me. "The last account of improvements I shall give (and which is, I think, the greatest and easiest to be come at,) is an improvement made by the burning of clay; the first experiment of which was made, as I am told, by the present Right Honorable Earl of Halifax, and is much practised in Sussex." This, however, appears to be a little different from what is usually understood by paring and burnnig, which consists in paring off the surface of land, or the grassy turf thereof, with an implement termed a breast-plough, to the depth of one or more inches, and in burning what is thus pared off by means of brushwood, peat, or other combustible materials, when the pared off materials are not combustible enough to burn without addition.

Mr. Minchin, of Hazleton, Gloucestershire, says it has been but a few years practised in any part of the kingdom, and was but little known till within the last sixty years in his vicinity, where, on the Cotswolds and the adjoining parts of Oxfordshire, it is so extensively, and, upon some lands, so uniformly, adopted, that it has become a striking feature in the rural economy of the district.

Effects of Paring and Burning.—It has already been hinted that the effects of paring and burning, so far as I understand them, are primarily very similar to those of fallowing, that is, the excrementitious matter thrown into the soil by previous crops, such as grass on old pasture, is, by the operation of fire, decomposed and exhaled into the air. The soil, which is thus freed from a portion of its noxious constituents, will of course be rendered more fertile than it could be by any other known process, not even excepting fallowing and manuring.

But besides the rapid decomposition and exhalation of the excrementitious materials in the soil, the burning will effect other important changes, though, as I shall try to show, these are, with respect to fertilizing, only secondary and inferior in value to the main operation of purifying the soil of what is chemically noxious. The chief of these beneficial though secondary effects is, that the fresh or but partly decomposed roots, stems, and leaves of grass, or other herbage, are, by means of fire charred, or, as a chemist would say, carbonized, and it is well known that carbon is, together with humin, the principal constituent of the food of plants. This carbon in the form of ashes is, after the burning, spread over the pared soil by way of manure, and is imagined by most writers to be the only advantage of the process, an opinion which I myself entertained not many weeks ago before I turned my thoughts to what I now consider to be a much higher result.

I have elsewhere (Field Nat. Mag. i. 49,) mentioned, that, on passing through the Black Forest in Germany in autumn 1832, I was particularly struck with the effect of paring and burning the soil. The steep and almost perpendicular declivities were there in their apparently natural state covered with stunted brushwood, chiefly birch and hazel, starved Scotch firs, and tufts of the coarser grasses; and no English farmer, I think, would have dreamed of trying to rear a crop of corn on such a place. The industrious foresters, however, undeterred by what might appear, under the most favorable circumstances, an indifferent prospect, carefully grub up the brushwood, pare off the scanty sward of grass, and, piling them up in small heaps, burn the whole to ashes. These are scattered over the pared surface, and dug or rather scratched in with a sort of pronged hoe or a narrow spade. In some instances a slight dressing of dung is added, though this is not universal; but after all these operations, the soil seems to be little more than a mass of half-broken and half-powdered slats. I was therefore not a little surprised to observe crops of oats growing there—not very good, certainly, but tolerable enough to repay the farmer's trouble. Had I then known the principles now advocated, I should have felt no surprise whetever at such a result; for the declivities having been for ages under brushwood and coarse grass, the whole soil, from its particular shallowness, must have been quite saturated with excrementitious matter, and this having been in large proportion expelled by burning, while another smaller portion would become decomposed in consequence of the pared surface being exposed to the warm autumnal sun, the whole must be very considerably purified and rendered fit, beyond what the inexperienced might believe, for sustaining a light crop of corn.

That it is not the ashes alone, produced by the burning, which cause the additional fertility, is proved by circumstances which every reader may remark. It is no uncommon thing in Scotland to make a fire by a burn-side for the convenience of heating water to wash with, and what I wish to call attention to is, that after some weeks or even a whole year elapses, these burn-side fire-places show very luxuriant grass, not in the spot so much where the ashes have been spread, as on the outskirts thereof, where the heat has decomposed and expelled the excrementitious matter of the soil. The same thing precisely may be observed in the green lanes about London, where the gipsies make their fires; and in the forests of the Jura in Switzerland, I was still more struck with the luxuriant herbage around the places where charcoal is manufactured, extending as far as the heat of the fire seemed to have penetrated. That it was not the accidental scattering of the ashes to which this very striking luxuriance was attributable, appeared most clearly from the effect being uniform to a certain distance from the central fire-place, the deeper green and the taller grass gradually shading off as this distance increased into the bare brown sward, if sward it might be called, of the forest; whereas, had the luxuriance been caused by the accidental scattering of ashes, it would have been patchy, irregular, and interrupted.

I will not deny, that the luxuriance may in part have been caused by the evolution by means of the heat of a greater proportion of humin, carbonic acid gas, or other constituents of plant food contained in the soil, and this indeed was the opinion I first formed; but when the fact is taken into consideration, that no supply of such constituents will produce the same effects as fire is observed to do, I hold this to be strong proof of the positions for which I am contending. Were the effect, indeed, to be ascribed to humin, we should find a similar deep green and luxuriant herbage around dunghills and compost heaps, from the drainings of liquid manure soaking into the soil. I need not tell the observant reader, that the herbage here is almost uniformly rank and dropsical, and as unlike the vigorous and healthy grass of the burn-side fire-places, the gipsy spots in the lanes, and the forest charcoal circles in Switzerland, as the bloated corpus of an ale-swilling publican is like the sturdy thews and sinews of a Lothian ploughman, or the fresh complexion of a Cheviot shepherd. Even the patches of tall grass in pastures, caused by cattle droppings, are too rank to be much relished by cows or horses. This explanation, then, of the effects of paring and burning having been so strongly corroborated by such well-known facts, it will be but right to advert briefly to the theories, or rather the fancies, of others, for they do not, as we shall see, account for many of the circumstances above pointed out.

Previous Theories of Paring and Burning.—It is not a little singular that the old popular notion on the effects of paring and burning is much nearer what I consider to be the true theory, than the one which has been promulgated by scientific writers. Dr. Home, in his "Principles of Agriculture," tells us that "farmers think it acts by dispelling a *sour juice* which land has contracted from lying long untilled;" and they accordingly recommend it for such lands, while they all agree that it injures rich land. In this, of course, they are quite right.

Dr. Home, however, was not content with this popular notion of a "sour juice," though, had he investigated the matter, he might possibly have been led to the great discoveries of Brugmans, De Candolle, and Macaire. Instead of this, he says, "I *imagine*, that the benefit arising from it is owing to the alkaline salt (*potass*) arising from burning the roots of vegetables;" and this, in fact, is the basis of most of the theories which have been proposed.

The objection made to this by the Earl of Dundonald is, it appears to me, fatal to the whole doctrine. "The proportion," says his Lordship, "of alkaline or other salts, produced by paring and burning, is so very small, that were the benefits immediately resulting from paring and burning to be ascribed solely to these salts, the purchase of them at the market price might perhaps be more economical."

Dr. Darwin, without taking any notice of Dr. Home or Lord Dundonald's notions, refers the effect to the supposed production of what he terms nitrous acid, observable in form of a calcareous nitre, as of efflorescence on mouldering brick walls. "As these soft efflorescent bricks," he says, "from old houses, are known powerfully to promote vegetation, when pulverized and mixed with the soil, at the same time that they are capable of producing nitrous acid, I *imagine*, that the use of paring and burning the turf of some newly enclosed commons depends on this circumstance; that is, that the heat emitted from the burning vegetable fibres unites oxygen with the clay, which forms more than half the slices of turf as they are dug from the ground. In other respects, the paring and burning of grass grounds would certainly be a wasteful procelure." All this being fanciful, it is well introluced, as we have seen Dr. Home's theory was, by the phrase, "I *imagine*."

The effects of paring and burning, as explained by Sir Humphrey Davy, are more conformable to fact than many of his other agricultural theories, and are only deficient, as the most of such theories are, in being confined to subordinate and secondary matters.

"Many obscure causes," says Sir Humphrey, "have been referred to for the purpose of explaining the effects of paring and burning; but, I believe that they may be referred entirely to the diminution of the coherence and tenacity of clays, and to the destruction of inert and useless vegetable matters, and its conversion into manure." "When clay or tenacious matters are burnt, the effect is of the same kind; they are brought nearer to a state analogous to that of sands.

"In the manufacture of bricks, the general principle is well illustrated; if a piece of dry brick earth be applied to the tongue, it will adhere to it very strongly, in consequence of its power to absorb water; but after it has been burnt, there will scarcely be a sensible adhesion.

"The process of burning renders the soil less compact, less tenacious, and retentive of moisture; and, when properly applied, may convert a matter that was stiff, damp, and, in consequence, cold, into one powdery, dry, and warm, and much more proper as a bed for vegetable life.

"The great objections made by speculative chemists to paring and burning is, that it destroys vegetable and animal matter, or the manure in the soil; but in cases in which the texture of its earthly ingredient is permanently improved, there is more than a compensation for this temporary disadvantage; and in some soils, where there is an excess of inert vegetable matter, the destruction of it must be beneficial, and the carbonaceous matter remaining in the ashes may be more useful to the crop than the vegetable fibre from which it was produced.

"All soils that contain too much dead vegetable fibre, and which consequently lose from one-third to one-half of their weight by incineration; and all such as contain their earthly constituents in an impalpable state of division, *i. e.* the stiff clays and marls, are improved by burning; but in coarse sands or rich soils, containing a just mixture of the earths, and in all cases in which the texture is already sufficiently loose, or the organizable matter sufficiently soluble, the process of torrefaction cannot be useful.

"All poor siliceous sands must be injured by it, and practice is found to accord with theory. Mr. Young, in his essay on manure, states, 'that he found burning injure sand; and the operation is never performed by good agriculturists upon siliceous sandy soils, after they have been once brought into cultivation.'"

Mr. Minchin is not disposed to admit Sir H. Davy's objection to paring and burning on light lands, till it has been experimentally proved, as all theories which bear upon practical subjects should be. What could be the motive of some proprietors in his vicinity for prohibiting paring and burning, I cannot conceive, unless it were some fanciful theory. The process was also discountenanced, if not prohibited, by the government in Ireland; whereas, it appears to me, it would be the most important measure that could be adopted in that country, for purifying the soil, now so overloaded with potato excretions, that extensive failures in the crop are not uncommon.

Mr. Hayward, a shrewd and intelligent writer, says, "it is evident that the most important and permanent effects of fire consist in imparting calcareous quality to the earth;" a thing which, if he had considered for a moment, he must have seen to be utterly impossible rather than "evident." His practical testimony to the effect of the process, however, is of more importance than the most ingenious theory. "I once saw," he says, "a very large field, of a stiff foxy clay, laid down to turnips, one-half had been reduced by burning, and the other not; the part that was burnt was clothed with as fine a crop of roots as could be wished for; whilst, on the other, the seed, although the same in both cases, and sown at the same time, appeared to have failed, there being only a few thin patches of plants; and the cause was obvious. The surface of the unburnt clay was closed, and rendered impervious, immediately after sowing, by rain; but the calcination of the soil in the other kept it open, and made it accessible to the air, which is positively necessary for the germination of seeds."

Watering Meadows or Irrigation.—It is not my intention here to enter on the wide and important field of the uses of water to the growth of plants, and I consequently pass over the modes of watering gardens and growing crops, where moisture is deficient, by rills of water carried into all parts of the field, as is usual in warm climates. I mean to confine myself at present wholly to the process of flooding meadows and pastures with water, either immediately after mowing, or during the winter.

I must request particular attention to this distinction, otherwise the principles to which I think the effects are referable must be misunderstood, and may be misrepresented, and to prevent this, I must, as I proceed, revert once and again to the distinction.

According to M. De Candolle, the practice of irrigation, in its several modes, was first introduced into Europe by the Moors, who constructed near Alicant a wall between two hills, in order to retain the water which flowed through the valley, for the purpose of irrigating the country. This wall is still in existence, and though only 24 feet long at the base, it is 260 feet long at top, and 67 high. In order to understand the principles which I shall bring forward, it will be indispensable to give some details of the process.

Process of Watering Meadows. — In the Black Forest, and in Switzerland, every mountain stream is conducted in a main run or feeder, along the upper part of a sloping field, or along the middle and the edges of a level one, raised on the summits of low ridges, to give a fall; while from these main streams, innumerable smaller streams branch off in the most convenient directions, to carry the water in every direction over the surface, small sluices or stops being placed at proper distances, to economize the water, and regulate its equal distribution. When I passed through these countries in autumn, they were then cutting their hay, in many instances the second crop; and as soon as it was off the ground, the whole of the fresh mown field was laid under water, rarely so deep as to appear above the short stubble, and no where allowed to stagnate, but moving slowly to the lower parts of the fields, where it was collected into a main stream, in the same way as it had been distributed. It is indeed an indispensable part of this system, that the fields subjected to it may be as effectually and speedily laid dry as they may be laid under water

In this country the process is different, at least as to the time when it is practised. As it is described by an intelligent writer, "the process of floating commences generally in the month of October, being as soon as possible after the aftermath has been consumed, or the second crop of hay removed. The water is kept upon the ground for periods of a fortnight or three weeks at a time; it is then let off, and the ground laid perfectly dry for five or six days; and this process of alternate flooding and drying is continued generally during the months of November, December, and January, care being also taken to let off the water when it begins to freeze. As the spring advances, and the grasses shoot forth, the periods of watering are shortened, so that the flooding shall not last above five or six days at a time. In the southern counties of England, the meadows are ready for the reception of stock of all kinds in the middle of March; but farther to the north, where the grasses do not make such early progress, the flooding is generally continued during the whole of the month of May. After this it is discontinued for the season, and a crop of hay, and sometimes two, are produced. The flooding is rarely practised during the summer months, though the admission of water during that time produces a rapid and rich vegetation. It is by summer flooding, where it is practised, that the fatal season of rot is introduced, so that no sheep should ever touch the meadows which have been flooded during the summer months."—[Quart. Journ. of Agric.]

Effects of Watering Meadows.—In the case of the overflowing of the Nile, the process of warping on the estuary of the Humber, and the flooding of land on the shores of Loch Ken in Kirkcudbrightshire, the effect is obvious to the eye; for as the water deposites on the land a coating of mud or sludge termed warp, varying in thickness as well as in fertility, this acts as so much manure or fresh soil spread over the fields. In the instance of warping on the Humber, however, the water, according to Arthur Young, is quite clear, and so far from muddy floods being advantageous, he says they actually spoil the warp. I would be inclined, therefore, to infer that the warp, instead of being brought by the water, was only formed by it from the surface of the soil over which it flows. But not having been myself on the spot, I can only hazard this as a conjecture, which, if found to be the fact, may account for the increased fertility produced by warping, from the excrementitious matter previously in the soil having been washed out and carried away on the retreat of the warping waters.

It is on the same principle, that I am inclined to explain the effects of watering meadows, both according to the Swiss and the British method. When the water in Switzerland is laid upon a hay stubble, and floated slowly over the field, it will be found to soak into the surface as deep or deeper than the roots of the grass around which the excrementitious matter thrown out during its summer growth must have accumulated. But in consequence of the manner in which the lower rills are disposed in the field, the water thus soaked into the soil does not stagnate there, but passes on, carrying away, of course, part of the excretions with which it has come in contact. In the same way, when clear water is floated over a pasture-field during the winter months, at alternate periods, as above described, a similar consequence must result.

This sort of irrigation, then, appears to perform, by washing, a similar effect to that which I have ascribed to decomposition by means of the sun's light, and evaporation by means of heat and the passing air in the process of fallowing, or by means of fire in that of paring and burning.

As we have seen that fallowing has the important secondary effects of opening and pulverizing the soil and of freeing the land from weeds, so has irrigation the important secondary effects of loosening at least the surface soil, and of carrying thereinto a fresh supply of air.

Throw a lump of tough clay into water, and let the water be a slow running stream, like that of an irrigating current. In a short time, the toughness of the clay will in part disappear to some depth upon the surface of the lump, which will be rendered pulpy and much less tough and tenacious than before it was thrown into the water. It will in fact become somewhat similar to the warp which would be left by clear water upon a stiff clay soil. By continuing the lump in the slow current, it would be gradually melted down, till the whole was reduced to what I may be perhaps allowed to term a warpy state, when

it would contain, of course, much more water than would be expedient for the healthy growth of any crop not naturally aquatic, but it would also contain along with the water a great proportion of common air.

Now, in this state of the lump of clay, thus reduced to a pulp, suppose the water to be turned off and it were left to dry; it would not then be rendered tough as at first, but would remain somewhat loose and pulverized. It would, indeed, only be restored to its original toughness, by assiduously kneading it to expel the air that tends to keep the particles asunder upon the evaporation of the water in the process of drying.

I think there can be little doubt that such, to a certain degree, according to circumstances, is one of the important secondary effects of irrigation. It may be objected, as I anticipate, that this softening of the surface, were the soil of the field very stiff and heavy, could not go deep enough to produce any effect upon the grass. I should answer, that if any such effect is produced, even to the depth of a quarter of an inch, it must be very beneficial to the grass, by opening the surface for the admission of air and rain. Every cultivator knows the importance of even breaking the crust of a surface without going to any depth to stir the soil. It is on this principle that the mere scratching of the surface of the mould in a flower-pot with a table-fork, or giving a very thin top-dressing of fresh mould, will produce surprising effects; and what must bear still more slightly on the surface,—brush-harrowing is often wonderfully beneficial.

As it is not improbable, I think, that the growth of moss on old pastures increases with the quantity of excrementitious matter accumulated, it might possibly much improve such lands, when not advisable to break them up for tillage, to irrigate them, if water could be had for the purpose. This, of course, could only be proved by actual trial. The proposal was suggested to me by having observed in Switzerland and the Black Forest, that fields subjected to irrigation did not exhibit any moss intermingled with their sward.

The application of the process to light gravelly lands is also highly beneficial.

Previous Theories of Watering Meadows.—In a good article on Agriculture in the "Modern Encyclopædia," 4to, London, 1816, we are told that when growing plants are covered with water, their growth, however vigorous before, is immediately stopped, unless they be water plants. They consequently die, are dissolved, and converted into vegetable mould; and thus does the floating of grass lands with water answer the same purpose as fallowing, which, as this author maintains, only effects the conversion of dead vegetable matter in the soil into mould. "Stagnant water," it is added, "deposites a sediment which, mixing with the dissolved parts of the vegetables all over the field, forms an excellent manure; and when the water is allowed to run off, the heat of the sun soon brings the highest degree of putrefaction on the dead vegetables, the effluvia of which, mixing with the mud deposited by the water, make it exceedingly rich." Those who have followed my line of explanation in the preceding page, will be at no loss to discover the very narrow and erroneous views contained in this extract.

Dr. Darwin has taken up the subject at considerable length in his "Phytologia;" but all his statements refer only to effects subordinate to the main principle of dissolving and carrying off the injurious and excrementitious matters in the soil. It may be proper to state some of his explanations. He tells us that by flooding, common meadow grounds are enriched, and morassy ones consolidated, by the mud brought over them from river water, after sudden rains, or with calcareous earth dissolved in many springs. "I am informed," he continues, "that water from springs is generally more effectual in promoting vegetation than that from rivers, which may in part be owing to the azotic gas or nitrogen contained in some springs;" "yet I suppose it to be principally owing to the calcareous earth which abounds in all springs that pass over marly soils, or through calcareous strata; and which does not exist in rivers." Now it has been mentioned above on the high authority of Arthur Young, that turbid water spoils the warps on the Humber, which can only be well effected when the river is clear. Would Dr. Darwin have maintained that this clear river water of the Humber contained more calcareous earth, or more nitrogen when muddy? If the fact is so, as it may be, in favor of clear spring water, the explanation is very simple to refer to its being able to take up and carry off more excrementitious matter than turbid water, while it seems far-fetched to refer, without good proof, to depositions of calcareous earth, or evolutions of nitrogen. Of one thing I am certain, that the irrigating waters which I observed in the Black Forest, and in Switzerland, were all as clear as crystal; and, in few cases, could be otherwise even during rains, considering the ground through which they for the most part flowed. Dr. Darwin, therefore, speaks theoretically when he says the water of most rivers, if not swelled by rains, are too pure for the purpose of irrigation, so far as its good effects are supposed to arise from calcareous depositions, a theory also advocated by Sir Humphrey Davy.

Another effect ascribed by Dr. Darwin to irrigation is, that the lands are defended from frost by the flowing water, or by the ice when it is frozen, and thus a much forwarder crop of grass is produced, as may frequently be seen over pieces of ground naturally moist, which look green in spring some weeks before that of drier land in the vicinity. Sir Humphrey Davy, in accordance with this theory, says, that flooding preserves in very cold seasons the tender roots and leaves of grass from being affected by frost. Water, he adds, is of greater weight at 42° Fahrenheit than at 32°, the freezing point; and hence in a meadow irrigated in the winter, the water immediately in contact with the grass is rarely below 40°. In an instance which he examined with the thermometer, the water was frozen above the grass, while the temperature of the soil under this frozen water was at 43°.

Yet, were practical irrigators satisfied with this theory, they would not, as they do, uniformly advise the waters not to be laid on during frost; because, as I would argue, the current so indispensable to the process could not be kept going on account of the ice. That it is not the additional moisture, as Dr. Darwin alleges, which causes the earlier growth of grass in spring, is proved by a similar effect being produced on boggy and marshy lands, where there is no lack of water, but which are as much improved by irrigation as dry lands, because the corrupted stagnant water is removed as well as the excrementitious matter. Nothing, therefore, could be more erroneous than the following passage from Sir Humphrey Davy. "When land," he says, "has been covered by water in the winter, or in the beginning of the spring, the moisture that has penetrated deep into the soil, and even into the subsoil, becomes a source of nourishment to the roots of the plants in summer, and prevents those bad effects that often happen in lands in their natural state, from a long continuance of bad weather." If, instead of "nourishment," we read "poison," it would be nearer the fact, for nothing is more injurious to plants than stagnant water or moisture thus as described remaining airless and motionless as it must do in the soil.

Sir Humphrey, however, appears to be correct in saying that irrigation acts by causing the more equable diffusion of nutritive matter existing in the lands; as Dr. Darwin is in saying the ground is rendered more easily penetrable to the roots of grass by its being kept softer.

The writer in this Journal, already quoted, concludes that the main effect of irrigation is produced by some mechanical or chemical action of the water, in a manner unknown to us, on the plants or the soil; and recommends the irrigator, while ignorant of the principle, to mark well the effects. The chemical or mechanical principle said thus to be unknown, is now, I hope, somewhat elucidated by the details which I have just given.

Draining.—It being of the utmost importance to the health of growing plants to have the water or moisture in the soil in continual motion, with the view of supplying their roots with fresh air, and also of carrying off the excretions which the roots eject, draining, it would appear, can scarcely be carried too far in any species of soil; for even in very light gravelly and dry soils, so long as there is no actual accumulation of water that can be brought to run, drains will be useful.

By a proper system of drains also in convenient localities, under ground irrigation might be practised with great advantage, both for supplying moisture when wanted, and for cleansing the soil (which could thus be effected more completely than by surface irrigation) from noxious excretions. I might here go over the whole process of draining as I have previously done over three other important operations, but this would extend this paper to a very unreasonable length, though I have studied more to condense than to expatiate, and have by no means, as may readily be perceived, exhausted any of the subjects.

The important subject of the *rotation of crops*, which would fall to be considered under the same principles, has been adverted to on more occasions than one in this Journal, and other publications, since De Candolle, in 1805, had the high merit of calling public attention to the excretions of plants, a merit of which no claimant can deprive him, though Mr. Towers (not adverting, it should seem, to this date,) thinks himself imperatively called upon to make good his title to the discovery in the year 1830. (Quarterly Journal of Agriculture, vi. 657.) Mr. Towers, in that paper, has made some valuable additions to the facts given by Brugmans, De Candolle, and Macaire; but that he is not more than De Candolle aware of the inferences to which the doctrine leads, appears from his quoting with approbation Mr. Mearns' proposal of watering greenhouse plants with water that has been used in irrigation, because it is loaded with nutritive matter; and even proposes to prepare such water artificially where it is not otherwise to be had, by filtering it through turf. (Quarterly Journal of Agriculture, iv. 807.) That such water may be good is possible enough, but it can only be good like a soil containing oxide of iron, in spite of the noxious matter which it contains along with nutritive matter, not in consequence thereof. The experience of Mr. Mearns, a clever and intelligent gardener, is worth volumes of theory, for his practice may be good, like Mr. Main's fallowing above noticed, while his theory may be altogether another affair, as in this instance it appears to be.

Whatever may be the ultimate fate of the explanations which I have above hazarded, they may probably lead to more minute investigation of processes acknowledged by all to be highly important, and deserving of the attention of those who have opportunities of verifying or disproving them. If the explanations are found to be unsound or fanciful, or any way satisfactorily disproved, I myself will be among the first to renounce them.

A Cure for Sore Backs of Horses.—The best method of curing sore backs is to dissolve a half an ounce of vitriol in a pint of water, and rub the injured parts with it four or five times a day.—[Sat. Courier.]

Description of the Dairy at Alnwick Castle.—"What price does butter command?" said we to a market-man, the other day. "That" replied he, "depends on its neat and cleanly appearance." This answer put us in mind of a thought that has often occurred to us—that many people might greatly improve their condition, and even become rich, simply by cleanliness. We take the following from the Edinburgh Quarterly Journal of Agriculture:

Having, a short time ago, visited Alnwick Castle, the princely mansion of the Duke of Northumberland, in Northumberland, I was particularly struck with the beauty of the dairy.

The cow-houses and dairy are beautifully situated at some distance below the castle, near the bank of the river Alne, which flows in a canal-like stream, ornamented with swans, through the extensive domain, amid fine shrubberies and delightful pleasure-grounds. The cows are mostly of the Ayrshire breed, though there are some Short-horn and cross bred cows. The object of the dairy being only to produce the best milk and butter, the cows are not selected for the purpose of improving the breed of the country, which, it is pleasing to observe, has, perhaps, already attained the highest degree of perfection of which it is capable. The cow-houses are commodious and airy. Each cow has a separate stall and manger, and every thing in regard to food and management is conducted with the greatest cleanliness and comfort to the animals. But the great object of attraction is the milk-house. It consists of an oblong building, standing apart, surrounded with a deep viranda, through which no sunshine can penetrate. The floor of the viranda is laid with different colored round pebbles, brought from the sea-shore. The light columns of wood which support its roof are festooned with clematis, honeysuckle, jasmine, passion-flower, and other climbing plants. The single apartment in which the milk is kept is about 30 feet in length, 20 feet in breadth, and 14 feet in height. It has two doors and four windows, the sill of the latter being about 4 feet above the floor. The floor is laid in an elegant tesselated form with bricks. The walls are covered with white glazed square Dutch tiles. The roof is of plaster, with a handsome cornice. A thin white marble slab as a broad shelving runs round the whole chamber, as high as the sill of the windows; but the middle of the floor is occupied by a very large and thick white marble table, raised about two feet above the floor, independently of its own thickness, and leaving a commodious passage between it and the marble shelving. The dishes of new milk are set upon the centre slab of marble. The dishes themselves consist of the finest Wedgwood ware. They are large, of a semi-ellipsoidal shape, having one extremity of the edge in the line of the conjugate axis, turned over in the shape of a lip, over which the milk is easily poured out of them. Large vases, and elongated jars of colored china, are placed as ornaments on the marble shelving round the walls.

The shining pearly lustre of the tiles on the wall, the icy-cold look of the white marble, the glossy splendor of the Wedgwood ware, and the brightness of the panes in the windows, all unite to impress the spectator with the conviction that no other union of earthly materials could so well express the idea of continued cold, with unsoilable cleanliness and perfect dryness, the essential properties of a milk-house. The very air in the chamber, in its coolness and transparency, associated charmingly with the purity of the milk. The hand of taste was conspicuous in the arrangement of the materials. There was much that was of a white color, and pure as it always was in every hue as reflected from the wall, the marble, the dishes, and the milk, these snowy hues were harmonized by the light of the sun passing through the greenness and freshness of the plants around the viranda; while the warm colors of the floor and of the rich patterns on the china jars, relieved the whole scene from monotony. In short, this apartment was the most delightful thing of the kind I ever saw. Its sweetness and beauty, derived from its fitness of purpose, are indescribable.

It is not necessary here to enter into the dairy economy. Suffice it to say, that both the milk and butter from this dairy have acquired a high character, of which the public have at times opportunities of judging; for when the noble family are absent from Alnwick, the produce of the dairy is permitted to be sold in the public market, where it is bought up with avidity.

There is a simple instrument used here for measuring the relative quantities of cream which the milk of different cows, at the different seasons of the year, affords. It consists of a stand of mahogany, supporting a number of glass tubes of equal length and diameter, graduated into degrees. New milk from different cows is poured in equal quantity into each tube, and the graduated scale marks the number of degrees the thickness of the cream occupies in each tube.

On the Increase of the Roots and the Stump in the Silver Fir, long after it has been felled. By M. Dutrochet, Member of the Institute, Paris. [From the Quarterly Journal of Agriculture.]

When a tree has been felled, and when no shoots arise from the stump, this stump, as well as the roots which fix it in the ground, fail not in a short time to die. The cause of this phenomenon is found in that well known law of vegetation by which the leaves are produced from the effect of the sap, the latter being essential to the life and growth of the tree, both in the branches and the root. When the stump reproduces stems after the tree has been felled, the roots may continue to flourish to an indefinite period. Thus, in coppice-woods, the roots of the same trees live through an indefinite number of centuries, and their existence may be prolonged to an indeterminate period. It is well known, that the coniferous trees never reproduce stems when the tree has been felled; and that the stump and roots which fix it in the earth usually die, and are quickly decomposed. There is, however, a very remarkable exception to this fact in the silver fir, (*Pinus picea*, Lin. *Abies pectinata*, De Cand.) The stump and roots of this tree continue to live, and even grow, during a great number of years. This singular fact was pointed out to me by my brother inspector of forests, one of the most intelligent men connected with the forest administration; though I must confess I doubted the fact until I was enabled to verify it myself. I have observed in the forests of the Jura, that all the stumps of the silver fir, whose branches had been many years felled, were still vigorous as well as their roots; while all the stumps and roots of the Norway spruce (*Abies excelsa*, De Cand.) were dead, including those which had been recently felled. I have seen old stumps of the silver fir, which, according to certain marks, had been felled forty-five years before, still full of life. The interior was entirely decayed, but the outer wood and the bark presented signs of life. These observations were made in the spring; the stump and the roots being full of sap, the bark, separated from the wood by the effusion of the pulp, (*cambium*,) was easily detached. This bark, and the wood adjacent, had all the appearances which these parts present when in a flourishing state. The existence of the pulp (*cambium*) indicated that the stump was increasing in diameter. This point I was also able to prove, which I did in the following manner. I perceived that a kind of enlargement was formed between the bark and the wood of the stump, and that this swelling, consisting of the wood and bark which had been produced since the tree was felled, had again covered a portion of the transversal section of the stump, so that the section of the sap which limited the central system of the tree at the time of its being felled was in perfect preservation. The traces of the axe on this sap, transversely divided, removed all doubts on this point. I have also seen on all these stumps an increase in the diameter from the production of new pulp, the thickness of which, in the old branches which I examined, was about two-fifths of an inch, so that these stumps, during the space of forty-five years, had acquired a total increase of four-fifths of an inch, or eight lines in diameter. The phenomenon which the silver fir presents in such circumstances appears at first sight to invalidate the theory which supposes the sap furnishing the materials of growth to be derived from the leaves, or the umbrageous part of the vegetable. But the extreme scantiness of the increase in the diameter of the stump of the silver fir, on the contrary, confirms this theory; for the stump, which continues to live during so great a number of years, increases thus slowly from the want of leaves, which are peculiarly the productive organs of the nutritive pulp. It appears that the roots of this tree possess the faculty of producing a small quantity of crude sap, and of converting it into nutritive pulp, which preserves life in the roots and stump, and contributes to their scanty growth during a great number of years. This faculty is wanting in the Norway spruce and the Scotch fir, (*Pinus sylvestris*,) of which the stump and roots die soon after the tree has been felled. Whence arises this difference? This is a question not easily decided. However this may be, the fact is very remarkable, which proves that the roots of trees, and the small portion of the stem which is left when they are felled, do, in certain cases, live a long time and increase, though not surmounted by any foliage.

Mice.—The following singular circumstance happened in the warehouse of the Dublin Custom-house, and as I had it from an eye-witness of the fact, I have no reason to doubt its authenticity. A bag of malt was hung upon the triangle from which the scales were suspended, and having remained some time, on being taken down from that situation, it was discovered that the mice had made this their granary, and many ran out, and were killed. They were left dead on the floor, and about four hours afterwards, no one having been in the warehouse during that time, there were but two or three remaining, but several live mice were seen in the room round the dead. The room was again visited in about an hour, when not a mouse, dead or alive, was to be seen. Much surprise was expressed at the sudden disappearance of the dead mice, when one of the persons present observed, that no doubt they had been buried by their companions. This occasioned a general laugh; but shortly after, on removing some reams of paper in the same room, which were placed more than six feet from the ground, in the opening between the reams was discovered a perfect cemetery, the dead mice being regularly interred, and covered with small particles of paper like a nest. Others were found in the same manner buried in piles of hides.—[Field Naturalist's Magazine.]

Life and its Concerns.—Time is like an oceanic whirlpool, moving us gently along in a wide circle, which continues to revolve and decrease with incredible rapidity, until we are suddenly ingulphed; and all that is known of us afterwards is some scattering undefined fragmental memento, seen rising and disappearing in the agitated and troubled waters.

On Enamelling Hollow Ware. By S. F. To the Editor of the Mechanics' Magazine, and Register of Inventions, &c.

SIR,—I know not to what cause it may be owing, that one of the most important and valuable improvements in the useful arts has not yet found a place in your Mechanics' Magazine and Register of Inventions and Improvements, but such is certainly the fact. The art of lining cast iron hollow ware with a coat of *enamel* or *porcelain* is certainly, in point of importance to mankind, and the credit due to its inventors, not surpassed, and cannot be surpassed, by any invention which has been or can be produced in the last, the present, or any other century.

Great credit has been given, and perhaps justly, to the inventors of spinning and weaving by mechanical power, thereby contributing to the clothing mankind, at the same time, with elegance and cheapness. But it has been objected, at least with plausibility, that these inventions serve to favor monopolies, and that they deprive the poor of labor. Great improvements have been made in the rapidity and cheapness of travelling, and transportation of goods; and to these also the world has been equally lavish in its applause.

But the advantages of wholesome iood are paramount in importance to either elegant or cheap clothing, or to travelling and transportation of goods; and when we duly consider the seemingly unavoidable evils which the human family has suffered since time immemorial, from cooking vessels composed of poisonous metals, constantly subject to corrosion or oxidation—the thousands of lives absolutely cut off, and the millions imperceptibly, but evidently shortened, by slow poison—who, that duly considers the subject, can hesitate to pronounce the invention of Messrs. M. H. Webster & Co., now in successful operation in Albany, one of the most useful and most needed improvements ever made by man: since it furnishes, at a reasonable price, every vessel constituting an entire culinary apparatus, embracing all the firmness and durability of iron without, and all the neatness, beauty, and indestructibility of a China vessel within—deprived of its brittleness, and capable of enduring any heat of a common fire without injury.

Heretofore, copper vessels lined with tin have held the preference; but the tin was soon worn out or melted off, and every time they were used presented the stomach with a small portion of copper in some state or other. If vessels, of what is commonly called tin ware, were used, the tin in like manner soon disappeared, at least in dsots, and presented an iron surface. If recourse was had to iron, though perhaps it contained nothing poisonous, it was sure to nauseate and discolor every thing which contained the least portion of acid. Thus we have been constantly subjected to having our food poisoned by copper, blackened by iron, or rendered unpalatable by both. By the invention of Messrs. Webster & Co. all these evils are completely remedied without a single concomitant disadvantage.

It is true, the same has been done before, by an individual in Germany, who, after long and laborious experiments, and vast expense, at length succeeded, not only in attaining his object, but in acquiring immense wealth. But it is said he keeps the knowledge still a secret within his own manufactory; it was, therefore, just as much an original invention with Messrs. W. & Co. as though no one had ever attempted it before.

The character of Dr. Beck, the partner of Mr. W., is too well established as a chemist to need eulogium, or even comment; and Mr. W., his ambitious fellow-laborer in the field of science, though young, has already done enough in conjunction with his partner to merit wealth equal to their wishes, and an imperishable name. The partners, it seemed, were not satisfied with the mere speculative results of chemical investigation—they were not satisfied to hold the light of science to aid others engaged in the useful arts—they wished to bring their light to bear upon new subjects, and show that they could venture with safety upon untrodden ground. They entered upon the subject in question, and pursued it with perseverance which could not be overcome. Their experiments were numerous and expensive, and they found difficulties which no reasoning *a priori* could have foretold. But they have overcome every discouragement.

It is now something more than a year since their business changed from a series of experiments to a regular and promising manufacturing establishment. They began upon a limited scale, as prudence would naturally dictate, intending to enlarge gradually, as the hands they employed should become waywise in the business, and acquire that practical dexterity in the manual operations which alone could establish the credit of their theory. Nothing is now wanting but to make their establishment known to the public, and to make known the advantages which must result from its encouragement. When this even begins to be effected, I should sincerely believe that no person in the United States capable of buying a pot, a pan, or a tea-kettle, would grudge the little extra expense of such an article as above described over iron or tin; and certainly, if compared with copper, there can be no grudging in the case, as the enamelled ware will be far the cheapest. It is often hinted, that female influence rules the nation; if so, put a small article of this ware into the hands of every good housewife, and give her time to examine it, and the fortune of the manufacturers will be established; for I will pledge my reputation she will never afterwards suffer a hollow cooking vessel of any other kind to come into her house. To conclude, I should presume that no man of sense would refuse, or even hesitate, to introduce the enamelled iron hollow ware into his house in preference to any other, especially to copper, as the copper will not only cost more and be less durable, but will subject him to the certainty of swallowing at least as much copper as will make a tea-kettle in his life-time. S. F.

AMERICAN MAMMOTH.—Professor Silliman, of Yale College, has recently delivered a course of lectures on geology at Hartford. In the course of one of them he exhibited to his audience one of the joints of the back bone of a huge Mastodon, or American Mammoth, recently discovered in excavating a race-way in the western part of Berlin. The Connecticut Courant states, that "the bone was in fine preservation, the principal change being in the color. It was probably one of the joints near the loins, where the back bone (from this specimen) must have been about 18 inches in circumference. This joint has a bone rising from the top of the vertebral column, about 14 inches, and sloping backward at an angle of 25 or 30 degrees. From the perfect condition of the bone thus accidentally discovered, there is reason to believe that a complete skeleton may be recovered by a persevering and diligent search in the morass where the specimen in question was found. Such a skeleton would be a noble memorial of the vast animals which once roamed through New-England."

DEPTH OF THE OCEAN.—One mile and sixty-six feet is the lowest depth to which the ocean has been sounded. Where the coast is rugged and high, the water is deep. All the surface covered by seas is three times greater than the dry land, being 148 millions of miles. If the medium depth of the sea be reckoned at two miles, there must consequently be 296 millions of cubical miles of water. The quantity, therefore, is sufficient to cover all the known dry land on the globe to the height of *eight thousand feet;* and further, were all this mass of water thrown into the shape of a ball, it would be *eight hundred miles* in diameter. Philosophers of enlarged views generally believe that the present beds of all oceans were at a former period the habitable parts of the earth. There is no other mode of explaining the presence of such immense masses of marine productions, quite in the interior of all the continents, as are continually brought to light, than by supposing they were once covered by the sea.—[Scientific Tracts.]

CAUSE OF FEVERS.—Hudson, the discoverer and first navigator of Hudson's river, on the 6th of September, sent a boat to sound the Kills between Bergen and Staten Island, and his men, on their return, reported that the "lands were as pleasant with grass and flowers, and goodly trees, as ever they had seen, and very sweet smells came from them." This is not now the case. The grazing of cattle, the rooting of swine, the plough, and other implements of agriculture, have entirely destroyed a great number of the annual grasses and plants which formerly flourished in this country. Several persons told Kalm, so far back as 1748, that the loss of many odoriferous plants, with which the woods were filled before the arrival of the Europeans, but which the cattle have now extirpated, might be looked upon as a cause of the greater progress of the fever; for the greater number of those strong plants occasioned a pleasant scent to rise in the woods every morning and evening. The vegetable kingdom of our western country is uncommonly rich, and luxuriantly abundant, because cultivation has been but partially extended to it. Hogs have produced great destruction among all tuberous and bulbous roots. Even the laurel tree of Carolina has become almost extinct in many parts of the country, owing to the depredations of domesticated animals.—[Ibid.]

SUBJECTS OF INQUIRY.—The following, among others, are still subjects of speculation and controversy: What is national wealth? the means of producing it? the influence or action of the generating causes? their immediate or distant effects? their ap-

parent or actual results? the different ramifications of the sources of wealth, such as labor, capital, the circulation of commodities or commerce? and the revenue or consumption? the source of wealth, whether in labor, foreign commerce, land, or capital stock? in what capital consists? the nature of money? the proportion which the circulating money of a country bears to the whole value of the annual produce circulated by it? Whether labor is the standard of value, and whether there is an immutable standard measure of value? whether agricultural labor is exclusively productive, or most productive? and perhaps the most controverted subject of political economy is, whether the home or foreign commerce is most productive of national wealth?—[Ibid.]

Picking Geese Alive.—Pennant, an English writer, says that geese are plucked five times in the year in Lincolnshire, once for the quills, and four times for the feathers—that he saw the goslings six weeks old deprived of their feathers and tails. Many of them perished under the operation. Picking geese alive is however a cruel practice; but, doubtless, there is one period of the year in which the feathers come off with less pain than at others. Moubray holds the following language:

A writer in the Monthly Magazine, December, 1823, remarks humanely on the cruelty of plucking the living goose, proposing a remedy, which I should rejoice exceedingly to find practicable and effective. He remarks on the additional torture experienced by the poor fowl, from the too frequent unskilfulness and want of dexterity of the operator—generally a woman. The skin and flesh are sometimes so torn as to occasion the death of the victim; and even when the fowls are plucked in the most careful manner, they lose their flesh and appetite; their eyes become dull, and they languish in a most pitiable state, during a longer or a shorter period. Mortality also has been periodically very extensive in the flocks of geese, from sudden and imprudent exposure of them to cold, after being stripped, and more especially during severe seasons and sudden atmospheric vicissitudes. There are many instances, in bleak and cold situations, of hundreds being lost in a single night, from neglect of the due precaution of comfortable shelter for as long a time as it may appear to be required. The remedy proposed, on the above authority, is as follows: Feathers are but of a year's growth, and in the moulting season they spontaneously fall off, and are supplied by a fresh fleece. When, however, the geese are in full feather, let the plumage be removed, close to the skin, by sharp scissors. The produce would not be much reduced in quantity, whilst the quality would be greatly improved, and an indemnification be experienced, in the uninjured health of the fowl, and the benefit obtained to the succeeding crop. Labor also would be saved in dressing, since the quilly portion of the feathers, when forcibly detached from the skin, is generally in such a state, as, after all, to require the employment of scissors. After this operation shall have been performed, the down from the breast may be removed by the same means.

The time has arrived, I trust, for successful exertions in the cause of compassion towards tortured and helpless animals; and I presume to make a serious call on the clergy and leading aristocracy of the districts implicated, for the exercise of their influence in this case, granting the reform to be practicable.

We fully believe that feather beds are worse than useless—that they have debilitated and seriously injured many a constitution. The following is from the Long Island Star:

Sir,—Believing as I do, that the cause of humanity is much neglected, and that there is still room for improvement, and amongst the various societies that have been formed to advance this important cause, such as the anti-slave societies, &c., whose object is to suppress cruelty, and advance the cause of humanity; and amongst the various species of cruelty, practised by those who profess to be conscientious of inflicting unnecessary pain either upon the human or animal creation, I consider that *picking geese alive* is one that might be ranked among the greatest.

Many are conscientious respecting nicking horses, and making use of slaves' produce, and hold it cruel and inhuman; I would ask a reflecting community, is it more so than picking geese alive? I answer, no! I am well aware that it is almost heresy to advance such ideas to many, especially those whose minds are shackled with the traditions of their forefathers. I have of late made mention of this subject, and have freely expressed my views, and am happy to say that many entertain views which accord with my own; yet there are many who stand strongly opposed. In a late conversation with some of those who are in this cruel practice, I was told unhesitatingly that if geese were picked in the right time, it caused no pain, which assertion I hold entirely erroneous, and will pledge myself to give one dollar per head for all geese that can be brought to me in a state that the feathers can be picked without pain. They may tell this to one who has never had experience and never witnessed the cruel scene of picking geese alive. The usual practice where I am acquainted is to draw a stocking over the head, in order to prevent the goose biting the one who picks it. I would ask those who advocate this inhuman practice, why does the goose bite? The answer will be, because it is hurt by forcing or extricating the feathers from their sockets of flesh, and for the better information of those who never have witnessed the picking of geese, I will give a faint idea of such a scene and its effects. I have seen a flock of geese which apparently were healthy, full of animation, which would not suffer any one to approach them, driven into a pen, caught and stripped of their coat of feathers, till they were almost naked. I have seen them lie panting and struggling under the most excruciating pain, whilst under this cruel operation. I have seen the blood flow from the veins—I have seen the flesh torn from the body, because the feathers were so strongly set in the body. I have seen the same flock, who but a few hours ago would not suffer you to approach them, stand by the way-side in a dull, stupid, and inanimate state, with their wings drooping to the ground, suffering me to approach them and take them in my hands. I would ask, what has caused this great change? Certainly nothing but the cruel operation which has been inflicted on them. And for what? Why, for the sake of gain, as it will be told you; and to justify this cruel practice, it is argued that it is necessary, so as to make the raising of geese lucrative, and it is necessary to have beds. To the first, I will propose to those who entertain such views, to take a flock of geese and divide them equal, and give them equal chance alike as to pasture or range, and pick one of the flocks, and then make sale of the feathers, and then purchase any kind of grain with the proceeds of such feathers, and feed it to the flock so picked, and they will find in the fall of the year that the geese which have not been picked will be earlier fit for market, and far heavier, and will make better returns; so, instead of its being advantageous to pick, it is an actual loss. This idea is supported by actual experience, and as to its being necessary to have beds, that we can have from the fall picking when sent to market. But I would suggest the propriety of sleeping on mattresses or beds of straw in warm weather, to promote health; and it is further argued, that if you do pick them they will shed their feathers, and then is the time to pick them so as to cause no pain. In answer to this, I will advise those who so argue, to try the experiment on themselves. Say, (to wit,) there are often times when the hairs of their heads or a part will come out without pain—let them suffer some one to snatch the hairs from their heads until it is as bare as the body of the goose, and see if it will create pain or not. Who can, after being acquainted with the reality of this species of cruelty, lay his head on a pillow of feathers with a clear conscience, knowing that the pillow is composed of materials which have caused severe pains and shedding of blood on a poor helpless animal, which might be obtained without pain. Much more might be said on this inhuman practice, but I am well aware that I have encroached on your columns by the length of this article; the object of my placing my views in your columns, is to give them a more wide circulation than I could otherwise do, hoping that a word to the wise is sufficient.

Pigeon Dung to prevent Worms in Carrots.—About five years ago, I had a heap of pigeon dung, which lay through the winter months on a quarter of the garden, and having occasion to move all this dung to other parts of the garden, I laid down the quarter with carrots, and was surprised to observe an extraordinary production o fthis vegetable on the spot where the dung had lain, both with respect to their size and clearness; and although some worms might have been found in the other parts of the quarter, yet I could perceive none in the spot alluded to. From that time this circumstance induced me to adopt the practice of sowing my carrots always in one particular spot of ground, which I have annually manured well with pigeon dung, laying on almost as much of it, though of a hot nature, as if it had been rotten horse-dung; and have the satisfaction to observe, that I have never failed to have an extraordinary crop, and, what is of more consequence, I can venture to affirm, that a worm could not be found in any carrots during the four years that I have continued this practice. Last year, in thinning my carrots, I transplanted a few of them into a piece of ground that had been well dunged with rotten horse-dung, and though they grew very well, yet they were so much cankered, that they were almost unfit for any use. All this leads me to think that pigeon dung is a good preventive of the worms in carrots.—[English paper.]

FATTENING HOGS.—This is the season in which the calculating farmer should have his hogs in a very thriving condition. We lay before the readers of the New-York Farmer the following hints from Fessenden's edition of Moubray on Domestic Animals.

Pigs will FATTEN either in confinement or at large in the yard. When in styes care should be taken that the pigs be all *ringed*, or they will not lie quiet; also that, when a number are fed together, any one at which the rest may have taken a distaste, be immediately withdrawn, or in probability they will tear him to pieces. For the same reason, a stranger should never be introduced. The fewer together, the more quietly and speedily they fatten, and by consequence, they succeed best singly. The troughs with SLIDING BOARDS before the meat, giving way to the snout of the pig, and shutting on his withdrawing his head, generally used in Hants and Berks, greatly prevent waste. They used, I recollect, to be provincially denominated *witches*.

WEANLINGS are fattened for delicate pork, chiefly in the dairies, where they are made ripe in a few weeks. Generally a pig of five or six months old will be fattened in seven, or eight, or twelve weeks, dependent on his condition. Small bacon hogs will be fattened in twelve weeks, the larger in sixteen to twenty. They should be kept perfectly clean, dry, and comfortable, for which daily attendance is necessary; and it is preferable, where time can be spared, to feed thrice in the day. The most correct feeders, and those largely concerned, endeavor so to apportion the meal that the trough may be entirely cleared, and yet the appetite of the animal thoroughly satisfied; a plan which has been proved in a thousand examples to fatten the most speedily, and make the fattest hogs; so totally opposite, nevertheless, to the ancient and still too common country method of filling the troughs at every feeding hour, whether empty or not. I have witnessed an old farmer repeatedly urging his servant to the performance of his duty, whilst the hog-trough remained constantly replenished with a mingled mess of meal and dung, of equal use to the hogs to lie and wallow in, as to feed upon. To speak guardedly, I have no doubt that, in former days at least, one bushel of corn in three has been in this mode converted to dung, without ever having entered the bodies of the animals. Two or three years since, a farmer published the following experiment, as an improvement of the established mode of pig feeding. He took two pigs of the same litter, and of equal weight, and fed them apart, one in the usual way on barley-meal mixed with swill, the other ate his meal dry, and had his drink given him an hour afterwards. At the end of six weeks, both hogs were weighed, when the one fed on dry food was a stone heavier than the other! The reader will judge whether this difference arose from the constitutional superiority of the heaviest pig, or the superiority of the new mode of feeding. Experiments on the point may be easily made.

Various articles for FATTENING swine.—Skimmed milk, and pea, oat, or barley meal, rank first in point of excellence with respect to the quality of flesh, milk-fed pork being superior to any other description, not only in delicacy of flavor, but in substance and weight, none weighing so heavy in proportion as the milk-fed animal. Hence the bacon of the dairy counties is superior. Milk will fatten pigs entirely, without the aid of any other food, a practice sometimes in the dairies.

CORN-FED pork is next in value, PEAS, OATS, and BARLEY being the best adapted grain. BEAN-FED pork is hard, ill-flavored, and indigestible; being potato fed, it is loose, insipid, weighs light, and wastes much in cookery.

CLOVER-FED pork is yellow, unsubstantial, and ill-tasted: fattened on ACORNS, it is hard, light, and unwholesome; on OIL-CAKE, SEEDS OR CHANDLERS' GRAVES, it becomes loose, greasy, and little better than carrion; on BUTCHERS' OFFAL, luscious, rank, and full of gravy, but of a strong and disgusting scent.* Compared with the general consumption of pork, the real DAIRY-FED meat bears a very small portion, and the sale of it in the metropolis is in comparatively few hands, always commanding a superior price. In some parts of France they SKIN their pigs intended for fresh meat.

A pig will eat two or three PECKS of corn or meal per week, in fattening; a hog upwards of a bushel, in proportion to his size. The following is an example of successful feeding. 'In the spring of 1805, Mr. Ivory, of Whitchurch, Salop, killed a hog of two years old, one side of which weighed 410 lbs. the other 414 lbs.; total 46 scores 14½ lbs. or about 111 stone, dressed country fashion. He was purchased very lean at two years old, price four guineas, was fattened in between seven and eight months, and then valued at eighteen guineas; subsequently, twenty-five guineas for him were offered and refused.' This hog probably made upwards of thirty pounds at the then price, and might have consumed full forty bushels of corn.

Swine should not be kept in close and filthy pens. Though they wallow in the mire, their object is coolness, not nastiness, and they thrive faster, and enjoy better health, when allowed clean and dry lodgings, than when they are not thus accommodated. The late Judge Peters, of Pennsylvania, in an article entitled 'Notices for a Young Farmer,' &c. observed that 'There is no greater mistake than that of *gorging* swine, when first penned for fattening. They should, on the contrary, be moderately and frequently fed, so that they be kept full; but do not loathe or reject their food, and in the end contract fevers and dangerous maladies, originating in a hot and corrupted mass of blood. In airy and roomy, yet moderately warm pens, paved and boarded, and often cleaned, they are healthy and thriving. They show a disposition to be cleanly, however otherwise it is supposed, and always leave their excrementitious matter in a part of the pen different from that in which they lie down. No animal will thrive unless it be kept clean.'

The same writer asserted that fatting hogs should always be supplied with dry rotten wood, which should be kept in their pens, for the animals to eat as their appetites or instincts may direct. It has been supposed, likewise, that swine thrive better when they can obtain fresh earth, which they are often observed to swallow with greediness. Charcoal, it is said by some, will answer as good if not a more valuable purpose; and that if swine can obtain charcoal, they will not only greedily devour a portion of that substance, but will be but little inclined to rooting, and remain quiet in their pens.

The modes in which swine are fattened in some of the western parts of New-York are stated to be these: 'About the first of September, begin with boiled potatoes and pumpkins, mashed together with a little Indian meal, ground oats and peas, or other grain, stirred into the mixture after it cools. From two to four weeks before killing time the food should be dry Indian corn and clear cold water. Mr. Yongham fattens his hogs in a large yard or field, with a shelter in it to which they may retire to sleep. But elder Turner says hogs should never know what liberty is; but should be kept close all their lives, and as inactive as possible. That with this method double the quantity of pork can be produced with the same expense of food.*

Rubbing and currying the hides of swine while fattening conduce as well to the thriving as to the health and gratification of the animals. It will be well, likewise, in every sty to place a strong post for them to rub against. During the time of their fattening they should have plenty of litter, which will be a double advantage, providing for their comfort, and increasing the quantity of manure.

There is a great advantage in boiling, steaming, or baking all sorts of food given to swine. The last American edition of Willich's Domestic Encyclopedia informs that a 'Mr. Timothy Kirk, of Yorktown, Penn. fed one pig with boiled potatoes and Indian corn, and another with the same articles unboiled. The two animals were weighed every week, and the difference between them was as 6 to 9. The same experiment was continued several weeks, and the animals alternately fed on boiled and unboiled food, with a uniformity of result, which sufficiently showed the very great profit arising from boiled food.'

A writer in the New-York Farmer for Nov. 1829, with the signature A. E., states, in substance, that Mr. William Canfield, of Schodack, Rensselaer county, N. Y., owns an orchard, wholly grafted with sweet apples, in which he kept his hogs most of the summer season, where the grass and a little whey were sufficient to promote their growth. About the time when hogs always manifest a disrelish for grass, the worm-eaten apples began to fall, sufficiently matured to become eatable. As they advanced in size and ripeness, they became more and more agreeable and more nutritious, until the hogs began to fatten rapidly on no other food. The trees were therefore shaken or beaten with light poles, so as to throw down a due quantity of the most ripened fruit. This process was continued until the whole herd was become sufficiently fattened. Then Indian corn was given in about half the common quantity for about one week, and full feeding of it another week. This brought them to the butchering, and the pork was not inferior to that which is fattened in a more expensive manner. One full grown tree, (or two inferior ones,) was found sufficient for a hog weighing 250 lbs.

* Store pigs, however, may be fed on almost any sort of food which they will eat, and thus acquire growth, and then for six weeks or two months before they are slaughtered they should be fed on grain and milk, which will harden and give flavor to the pork.

* Memoirs of the New-York Board of Agriculture, vol. ii, pp. 39, 40.

A writer, whose communication was published in the N. E. Farmer, vol. v, p. 82, states as follows:

"I have tested by ten years' experience, the value of apples as food for animals. I keep five or six hogs in my orchard, upon nothing but apples and a little swill; and have uniformly found them to grow and gain flesh faster than hogs fed upon any thing else except grain. On the first of November they are very decent pork; after which I feed them about six weeks on grain before I kill them, and I believe I have as fat hogs and as good pork as my neighbors, who give to their hogs double the quantity of grain that I do to mine."

An English writer says, "swine will fatten much faster on warm than on cold food." Corn and cold water will make them healthy, but warm beverage is considered as requisite to a quick growth." Some English farmers keep two or three little store pigs in the fatting sty. While the fatting hogs are taking their repast, the little ones wait behind them, and as soon as their betters are served, lick out the troughs.

"Besides the advantage of having by this expedient no waste nor foul troughs, there is another. The large pigs rise alertly to their work, lest the small ones should forestal them, and fill themselves the fuller, knowing that they have it not again to go to.

"The disadvantage of this practice is, I understand, the large ones are apt to lord it too much over the little ones, especially in a confined sty. If, however, they had a separate apartment assigned them, with an entrance too small for the fatting swine to follow them, this advantage would be in a great measure remedied."

Carrots, according to Arthur Young, are better food for swine than potatoes, and some other writers assure us that parsnips are better than either for feeding them. An English writer asserts that "they fatten all their pork in the island of Jersey with parsnips. They are more saccharine than carrots, and it is well known that nothing fattens hogs faster, or makes finer pork, than the sugar cane."

Mr. Young asserts that "the most profitable method of converting corn of any kind into food for swine is to grind it into meal, and mix this with water in cisterns, in the proportion of five bushels of meal to one hundred gallons of water, stirring it well several times a day, for three weeks, in cold weather, or a fortnight in a warmer season, by which time it will have fermented well and become acid, till which it is not ready to give to the swine. The mixture should always be stirred immediately before feeding, and two or three cisterns should be kept fermenting in succession, that no necessity may occur of giving it not duly prepared. The late Judge Peters, formerly President of the Pennsylvania Agricultural Society, also asserted that "sour food is most grateful and alimentary to swine. One gallon of sour wash goes farther than two of sweet."

Some sentiments, however, which are apparently in opposition to the opinions of the above celebrated agriculturists have been advanced by other writers. An English work, called "Farmer's Calendar," author's name not given, declares that much has been said and little understood about *purposely* souring food for hogs. It is not that acidity can possibly tend to making fat, but it is found that pigs will readily fatten upon sour or rather acescent food, a sweetish taste and glutinous quality succeeding fermentation; and that they will do still more readily on such as never reached the acid state I know, and have seen in hundreds of instances."

In order to reconcile these writers, it is only necessary to advert to the different stages of ordinary fermentation, and the products of each stage. The first stage of fermentation produces sugar, and is called the saccharine fermentation; the second stage developes alcohol, [spirit of wine,] and is called the vinous fermentation; the third produces vinegar, and is called the acetous fermentation; and the fourth and last stage converts the matter fermenting into a substance, which is not only offensive but poisonous, and is called the putrid fermentation. Thus, if you soak wheat or other farinaceous substance in water, of a proper temperature, it will first begin to sprout or vegetate; it will next afford spirit or alcohol; continue the process, the wash turns sour, at first slightly and then more strongly acid; and at last the whole becomes putrid. It probably contains most nourishment when it is sweetest, but is valuable till very sour, when it is worth but little or nothing; and when the putrid fermentation has commenced, it is worse than nothing as food to any animals. The wash, then, should be given to the hogs while it is sweet, or but beginning to be sour.

Cobbett recommends keeping hogs till they are more than a year old before they are killed. He says, "the flesh is more solid and more nutritious than that of a young hog, much in the same degree that the mutton of a full-mouthed wether is better than that of a younger wether. The pork or bacon of young hogs, even if fattened on corn, is very apt to *boil out*, as they call it; that is to say, come out of the pot smaller in bulk than it goes in. When you begin to fat, do it by degrees, especially in the case of hogs under a year old. If you feed *high* all at once, the hog is apt to surfeit, and then a great loss of food takes place. Make him *quite fat* by all means. The last bushel, even if he sits as he eats, is the most profitable. If he can walk two hundred yards at a time, he is not well fatted. Lean bacon is the most wasteful thing a family can use."

Other agriculturists, however, express a different opinion from that of Mr. Cobbett with regard to the time which hogs should be kept on hand before they are killed. Mr. Featherstonhaugh, (in Memoirs of the New-York Board of Agriculture, vol. i. p. 332,) says, "Farmers differ much in their plans of holding stock for pork, some permitting their shoats to run at large eighteen months till they are penned up to fatten; this is the most troublesome and the least profitable way: others give them a range in clover pastures, and begin to fatten them earlier. I apprehend there is a much more profitable way, and attended with less trouble for those who have the right breed. According to the quantity of pork wanted should be the number of breeding sows kept over, and there should be no other hogs on the farm, [that is, kept over winter,] but the breeding sows. These, when they pig the latter end of March, should be fed in the most attentive manner, with swill and shorts. The pigs from a full grown sow will generally be twelve in number; these should be thinned down to eight, and as soon as they begin to feed freely out of the trough should be weaned and afterwards fed regularly with green tares, clover, boiled potatoes, ground peas, unmerchantable corn, or any other nourishing food; turning them out every day into a small yard, where there is a shallow pond for them to lie in."

In the county of Rensselaer, N. Y., some farmers assert that "March pigs, killed about Christmas, are the most profitable for pork." Others say, "Pigs ought never to come until June, for the cost of earlier pigs exceeds the profit." And further, we learn that the methods proposed for fattening hogs by the different farmers in that county are very various. Some recommend keeping hogs in pastures, with some slops from the dairy, &c. till near the last of August—some say a little later. All agree that near this time they manifest a disrelish for grass. Small patches of peas, or even of corn, will then be convenient to turn them into for a few weeks.

Gama Grass.—Our readers will recollect to have seen, in a former number of the Farmer, some account of the rapid and luxuriant growth of this species of grass. Small quantities of the seed of this grass have been distributed among the agriculturists of several States; some of whom, from its singular shape and appearance, and from its slowness to vegetate, have entertained doubts of its being *in fact* the seed of any plant. We received from Dr. Bartlett, of Georgia, editor of the Southern Planter, not many months since, a small quantity of this seed, which was distributed among our friends. We have since learned that the unusual length of time which it requires to vegetate renders it exceedingly liable to be destroyed, when planted in the usual way; and we fear that our friends who received seed from us may fail of success in producing the plant, for the want of a knowledge of this fact. It is said to have been, in some instances, fourteen months, after it was planted, in coming up.

We disposed of all the seeds we received but two in number; these were planted in a cloth with grape seeds, and kept constantly wet with water, near a stove in the kitchen, for two months, at the end of which time they were found to be sprouted.

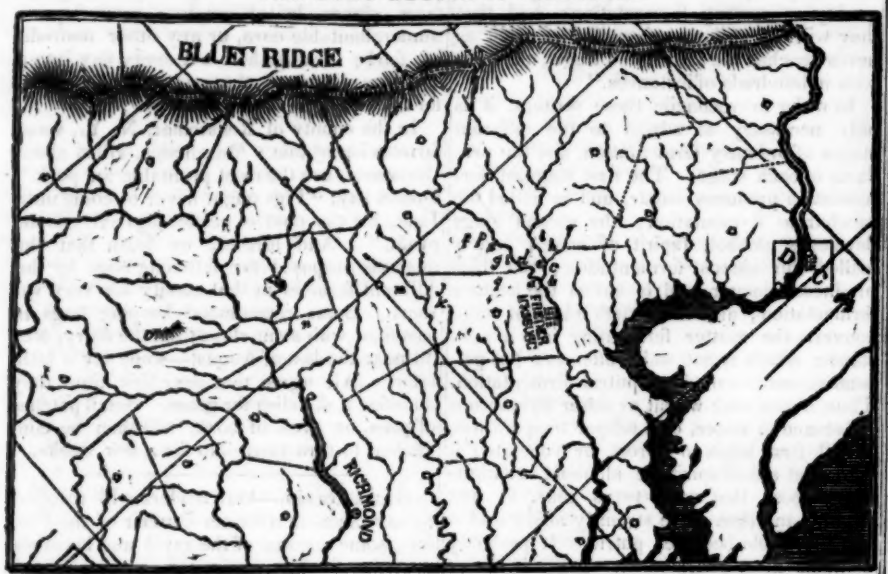
They were then planted in a dry sandy loam, and now grow with great rapidity. Whether the plant will be of any value in our climate, remains to be treated by experience hereafter.—[Northern Farmer.]

Early Potatoes.—Extract of a letter, dated Wilmington, Delaware, August 5, 1834, to H. Huxley & Co.

"I should be glad to have information from you, in reference to the earliest kind of potato known. It is of great importance in small gardens to have a potato that does not run to vine, and that forms its tubers soon. In this case they may be planted closer, and thereby we can economise the land. It is far better to have a small piece of land well attended to, and under high cultivation, than own a large farm in a ruinous condition. On this view of the subject I was induced to rent a small piece of ground, in order to ascertain the merits of different kinds of fruit, grain, grasses, and vegetables; and if my life and health are spared, I hope to be useful in this way. Such is the extreme dryness of our climate at some seasons, and also extreme wetness at others, that vegetables, in varieties so numerous as the pea and bean, afford ample scope to ascertain the best for cultivation on an average.

H. Elliott."

THE GOLD REGION OF VIRGINIA.



REFERENCES.

a,	United States Gold Mine,		Spotsylvania county.	
b,	Rappahannock	"	Stafford	"
c,	Rattlesnake	"	do.	"
d,	Culpepper	"	Culpepper	"
e,	Millbank	"	do.	"
f,	Virginia	"	Orange	"
g,	Vaucluse	"	do,	"
h,	Liberty	"	Faquier	"
i,	Union	"	do.	"
j,	Johnson's	"	Spotsylvania	"
k,	Dixon's	"	do.	"
l,	Mellville	"	Orange	"
m,	Tinder's	"	Louisa	"
n,	Goochland	"	Goochland	"
o,	Booker's Willis mt.	"	Buckingham	"
p,	J. Payne's	"	Orange	"
q,	Greenwood	"	Spotsylvania	"

This map exhibits a condensed view of the gold region of Virginia, and is taken from a larger one belonging to Mr. F. Shepherd, of New-Haven, who has spent some months in surveying and exploring this interesting portion of our country. We say interesting, because the amount of gold annually obtained in the United States is estimated in millions of dollars; and this amount is rapidly increasing, when, comparatively speaking, the surface only of the ground has been disturbed in getting this precious metal.

We learn from Mr. S. that the undue excitement which the first discovery of gold creates in the minds of all classes, is now at an end in Virginia, and the business of getting gold is assuming a settled and systematic character. The farmer now goes on with his farming, and the experienced miner with his mining, and in this way each is mutually an aid to the other.

As to the richness of the Virginia ores, Mr. S. has given us full satisfaction, by simply pounding them in a mortar and washing away the sand in our presence, when, to our surprise, a large proportion of metallic gold appeared in numerous and beautiful grains, and this, too, from specimens which had no gold visible on the outside.

The following is an extract from the report of Mr. Shepherd:

"I am decidedly of opinion that Virginia is destined, sooner or later, to become a rich and prosperous mining country; that whenever skill and capital shall be judiciously applied, (in the language of an able and beautiful writer,) she will one day be to the country what Cornwall is to England, the seat of prodigious industry, and the source of individual and national wealth."

In coming to this conclusion I do not lose sight of the great natural advantages which Virginia possesses over other mining districts in the United States, and throughout the world. It will be seen by the map, that by a little more than half a day's ride, any one can be transported from the city of Washington, on the Potomac, to the gold mines on the Rappahannock, on the banks of a beautiful river made navigagable by locks and dams, a distance of ten miles to tide-water and steamboat navigation, commencing at Fredericksburg, which is a busy inland town, at all seasons supplying a plentiful market. Add to this the very low price of provisions and labor, the vast abundance of wood and timber, the great number of water powers easily created upon the numerous streams, the peculiarity of the soil and earth as affording facilities for excavation, (since steam is now applied to all kinds of digging,) and finally the beautiful developement of the rich gold veins, said by those who have been observers in both countries, by far to excel Mexico, South America, or even Russia, so much celebrated of late for her gold mines. These veins are composed of quartz, commonly called white flint, from one to four feet in thickness, generally perpendicular in the earth like a wall, supported on both sides by soft talcose slate, and extending from the surface to an unknown depth. It is not uncommon to find gold in the broken fragments of the veins at the surface, and it has also been found at the depth of 160 feet increasingly rich. The gold district lies in that part of Virginia between the tide-water and Blue Ridge, where the atmosphere is dry and exhilarating, the climate mild and agreeable, the water well tasted and pure, the inhabitants of that class so long and so justly famed for their hospitality and refinement, and for whose convenience, the great National or Southern Railroad is about to pass by them as it were at their thresholds.

Still, with all these natural and extraordinary advantages, I feel it my duty, continues Mr. Shepherd, to give my friends and fellow-citizens of New-England a few words of advice, by way of caution. That there is a very large amount of gold in the great State of Virginia, and that this large amount of gold may be extracted so as to afford a large profit, is clear to a demonstration; and I believe that this section of our country is worthy the attention of northern enterprise and capital. Yet it frequently happens that many persons have an idea that wherever gold is discovered, if they can but get possession of the lands, no matter at what price, their fortune is made for a certainty. This foolish impression has ruined many a man. The temptation is so great, that where a person wishes to sell his land as gold land, and cannot find gold upon it, in order to effect his object, he will sometimes bring gold sands and ores from a distance, and bury them upon his own grounds, which of course the purchaser finds out to his sorrow when too late. Again, some persons, on finding a few grains of gold, suppose that if they dig deep they will surely find the precious metal in masses and blocks. It is needless to add that such visionary day-dreams are rarely realized—still many are sanguine enough to pursue the chance with great ardor.

To those persons who engage in this business for the purpose of speculation, I would say that they will only be benefitted at the expense of others, and will injure the mining interest of the country more in a few days than they can possibly repair in many years.

Finally, persons ought not to engage in this business without previous skill and experience. It is obviously unsafe for them to do so; and here is the cause of so many failures of companies and individuals. Gold mining is as much an art or trade as iron mining. What company of farmers would undertake of themselves to get iron from the ore? And what would be the probable result of such an undertaking? What would be the result if this same company of farmers should undertake to work the ores of zinc, so rich and abundant in this country? I have no doubt you anticipate the result correctly; and the same result is to be expected in their undertaking to get gold. Some persons in their ignorance suppose that if they expend a large amount, or venture a large sum, that they shall certainly realize something in return. Such visionary men lose their all, generally; whereas, in the hands of a discreet and experienced man, every cent of that money, like the well directed blows of the axeman, would be turned to a good account; and instead of a loss, he would reap a reward of an hundred fold. In proof of this, I have known a man to expend ten hundred dollars and get ten thousand dollars of gold for his reward, and from an examination of his lands, believe that he might labor all his life in the same prudent way, and with the same good success. Again, I have known another man, in the same situation precisely, expend the same sum and get nothing but a load of debt upon his shoulders instead of gold. Now will you say that these mines ought not to be worked? No, you will say let them be worked by honest, experienced, and prudent men. Let this be done, and the capitalist will find his money profitably employed, and the millions of gold in Virginia will be made to circulate and gladden the hearts of millions of the human race now pining in want and "perishing for lack of knowledge."

THE WILD OR CANDLEBERRY MYRTLE, A REMEDY AGAINST THE WEEVIL.—[We should suppose myrtle equally beneficial to wheat.]

Dear Sir,—Information on all and any subject, connected with agricultural pursuits, will, I presume, find admittance into your periodical, and although the notice may be of apparently small matters, yet to some one of your readers it may be new, and let me add, valuable. I am induced to make these remarks from the inconvenience I suffered for many years, from the destruction of my corn by weevil, and the total absence of them now, in consequence of the application of a very simple remedy. The land which I plant in corn is low, and requires almost as much draining as the river lands, but is productive, and yields abundant crops. Whether it is owing to the location of the land, or other (to me) unknown causes, I am unable to say, but the fact is, that the corn is often taken from the field with a great many weevil in it. No injury seemed to result from their residence in it, while in the field, or during the cold weather, but as soon as the summer's sun had shed his genial warmth upon us, these intruders gave notice of their existence, by commencing the work of destruction. Upon several occasions my provisions were materially injured, and much complained of by the consumers. I tried a variety of remedies, without effect. Late planting, and early planting, were both sug-

gested and tried; the land was all broken up deep in the winter with a plough; the seed was coated with tar and soot, and finally was brought from one of the sea-islands at a distance and planted. The crops, I think, were improved by each of the remedies in quantity, but the enemy still retained his position, unmoved, and apparently immovable. I was one day mentioning the circumstance to a friend, who told me that he had understood that the wild myrtle, (Myrica cerifera,) was a sovereign remedy for this seemingly incurable disease. At this time the destruction had commenced, and the insects were to be seen in every direction; a quantity of myrtle was procured, and spread over the top of the corn, and directions given to follow it up, if any effect was visible. My removal to town for the summer prevented my attending to the business any farther, and I learned upon inquiry in the fall, that "it *seemed* to check the weevil in some degree." This was not satisfactory, and as the corn in the field was apparently more than usually infested, I determined to give the experiment a fair trial. The corn-house was emptied, and swept, and washed with boiling water; the floor was then covered with myrtle; a layer of corn about a foot deep was then brought in, and then a layer of myrtle, and this management continued throughout the whole harvest, observing to cover the top of the corn with a bed of these little bushes. During the winter I several times examined the corn, near the door, and saw no weevil, yet I was fearful, that in the body of the house the mischief might still be going on. Late in the spring we began to use the corn freely, and still found no weevil; the crop was eventually consumed, and was to the last entirely free from insects of all and every kind.

This was to me satisfactory, and the rule has been uniformly observed of strewing the house with myrtle, and no weevil have since been seen. My corn-house is divided into two bins, and an entry; and this year I had planted a small field alone, and desired that it might be kept separate. Into this entry it was thrown, and no myrtle was put with it, but the two bins were as usual well supplied. Upon my examining the corn-house, I found the corn in the entry filled with weevil, while that in the bins was perfectly free from all insects. The corn was immediately removed, and though filled with insects, was divided between the two bins, and myrtle plentifully strewed over the top of each. I am now eating the corn, and the weevil are no where to be found.

This last *accidental* experiment is more convincing than either of the others; here the two bins were free from weevil, and the corn which was separated from them, only by a loose board partition, was filled, and I have little doubt, would have been rendered unfit for use before the summer was over. Perhaps, Mr. Editor, in giving you and your readers the information detailed in this paper, I have been "carrying coals to Newcastle;" if so, light your spirit lamp with it, and I shall be satisfied, as my only object is to do good, and not to see myself in print.

With my best wishes for your restoration to health, and success in your pursuits, I remain your friend, Z.—[Southern Agriculturist.]

Culture of Potatoes and Indian Corn.—On passing a well cultivated farm two days ago, I observed in a potato field that the earth had been drawn up into hills nearly one foot high and somewhat conical, closely round the stems; and I doubted if that labor had been well directed. It is now twenty-five years since I had a patch of potatoes which we had commenced hoeing in dry weather. A neighbor mildly remonstrated with me against our proceedings, and said that *potatoes hoed in dry weather generally yield a poor crop.* I had not duly considered the subject, but I took his advice, waiting until we had a rain before we hoed the remainder, and the difference in the produce of the two parcels was as great as he had predicted,—certainly more than three to one in favor of hoeing when the ground was well moistened. It was not so wet however as to be muddy. The cause of this result was that the leaves of the potato shed the rain, and turn it from the hill, perhaps more than any other vegetable which we cultivate; and if the hills be made *high* and *sharp*, and once become dry, a moderate shower of rain will rarely penetrate to the roots.

The potato, to yield abundantly, requires a plentiful supply of moisture, although it is very impatient of stagnant water; and some may wonder why its leaves should turn off the very thing for which its roots are languishing. It should be remembered, however, that the potato grows indigenously in a very different and distant country from ours. In a state of nature, no hills are piled up round its stems; and in our culture, we ought to consider the constitution of the plant, and remedy as far as practicable the defects of our climate. If it is cultivated in HILLS, these ought to be neither high nor sharp, but depressed on the summit; or rather shaped like a basin, to catch the rain as it falls, and turn it towards the roots. If it is cultivated in ROWS with the plough, the same object should be borne in mind. I have seen a plough with an additional piece of wood on the mold-board, so as to raise the earth high round the stems; and when the work was finished, the ridges were sharp like the roof of a house, and turned off the water nearly as well. The appearance of a field soon after the operation was fine; but the crop, as we might expect, was very light.

Indian corn, on the contrary, will bear hilling much better; though I think this business is often overdone. It is very evident that all the loose earth should not be scraped from the furrows between the rows, as I have sometimes seen it; for in heavy loams, the hard ground, if left uncovered, is sure to crack in dry weather, and *let out the moisture* from below. I shall recur however to my first remark on this plant. The leaves of Indian corn are so constructed as to turn most of the rain that falls on them down to the roots. After a short but dashing shower, I have soon after found the other parts of the field comparatively dry, while it seemed as if a basin of water had been poured into each hill.—[Gen. Farmer.]

If the words 'hilled up' were substituted for 'hoed' in the sentence in Italics, we think it would be more correct.—[Ed. N. Y. F.]

New Bread.—A Parisian chemist has established a bakehouse for bread made from potatoes, which is animalized by the addition of the gelatine made from bones. In this way, a food which is said to be equally pleasant and more nutritious than wheaten bread, is obtained at half the expense of the latter. A large quantity of biscuits for the use of the African expedition has been made upon this plan. In a time of scarcity of corn the discovery will prove a great blessing.

To keep Plums and Peaches fresh thro' the Year.—Beat well up together equal quantities of honey and spring water; pour the mixture into an earthen vessel; put in the fruits all freshly gathered, and cover them up quite close. When any of the fruit is taken out, wash it in cold water, and it will be fit for immediate use.

A Mongrel's between a Dog and a she Wolf.—Dr. A. F. Wiegmann, Jun. relates the following circumstance as occurring at the Isle of Peacocks, near Potsdam. A setter dog copulated with a she wolf; and she afterwards gave birth to three female pups, differing very much from each other. One, which died, resembled a wolf more than the two others, particularly in the hair, having, on the anterior parts of the legs, the black line which characterizes that animal. The second also resembled the mother, excepting in the position of the eyes, which was the same as in the dog. The third was, properly speaking, a setter dog, but imperfect in some respects; its character was gentle, whilst the others had a ferocious appearance. The father was white with brown spots; of the little ones, on the contrary, the first had the hair and color of the wolf; the second was white on the throat, cheeks, and on the sides of the neck, and black on the back; and the third had a white band on the fore part of the neck, and between the legs, the back of the same color as the second, and the ears rounded, pendant, and of moderate length. The tail was not erected in any of the three.—[Isis.]

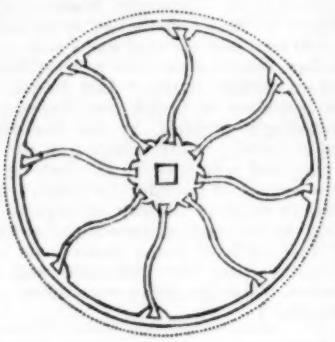
Shells on the Snowy Mountains of Thibet.—At a meeting of the Asiatic Society of Calcutta, on the 5th May last, extracts from Mr. Gerard's letters, relative to the fossil shells collected by him in his late tour over the snowy mountains of the Thibet frontier, were read. The loftiest altitude at which he picked up some of them was on the crest of a pass, elevated 17,000 feet: and here also were fragments of rocks, bearing the impression of shells, which must have been detached from the contiguous peaks rising far above the elevated level. Generally, however, the rocks formed of these shells are at an altitude of 16,000 feet, *and one cliff was a mile in perpendicular height above the nearest level.* Mr. Gerard farther states, "Just before crossing the boundary of Ludak into Bussalier, I was exceedingly gratified by the discovery of a bed of fossil oysters, clinging to the rock as if they had been alive." In whatever point of view we are to consider the subject, it is sublime to think of millions of organic remains lying at such an extraordinary altitude, and of vast cliffs of rocks formed out of them, frowning over the illimitable and desolate waters, where the ocean once rolled.—[Asiatic Register.]

Artesian or Overflowing Wells.—The irruption of the water, on first piercing these subterranean reservoirs, is often very violent, and is no small proof of the copiousness of many of these wells. Some striking examples of this are quoted from England in the Bibliotheque Universelle, t. xxxix. p. 199. A Mr. Brook had sunk a bore in his garden 360 feet deep, and 5.5 inches in diameter, from which the water was discharged so copiously, that it not only overflowed the whole yard round the house, but also submerged the adjoining cellars. The damage was so great that the neighbors lodged a complaint, and the police were required to interpose. Two men now tried to close the bore with a wooden peg, but they were constantly driven back by the violence of the water, even when a third came to their assistance. They were equally incapable of restraining the water by an iron stopper. At last they took the advice of a mason, and planted several tubes of small diameter over the bore, and thus succeeded at last in mastering the water. At a Mr. Lord's, in Tooting, where a bore had been closed, the water worked with such violence under the ground, that it burst forth in a space 15 yards in circumference, and certainly the walls would have been brought down if free vent had not been given to it. This spring, say the informants, on account of the height of its jet, and the quantity of water (600 litres per minute,) is worthy of being in a public square. The stream of a well belonging to neighbor of Mr. Lord, drove a water-wheel of 5 feet in diameter, and this again set a pump in motion, which carried the water to the top of a three-storied house. We quote this passage from an article in Jameson's Journal, No. 17, to direct the special attention of the reader to the whole of the interesting and important paper.*

* M. Mallet, by an ingenious contrivance, is enabled to make use separately of two kinds of water, sometimes found in a single boring, such as hard and soft water.

Experiments on Wheels with Straight and with Curved Arms. [From the London Mechanics' Magazine.]

SIR,—Having read some remarks, by two or three of your correspondents, in regard to springs as applied to locomotive engines and other heavy carriages, and noticed the suggestion thrown out, that the spokes or arms of the wheels might possibly be made of such materials, and of such a form, as of themselves to counteract sufficiently the jolting of the superincumbent and progressing weight, and so dispense with the costly springs at present used, I am induced, by the perusal of these speculations, to send you an account of some experimental observations of my own, which have, I think, a strong bearing upon the subject. About five years ago, I fitted up some waggons, for a coal concern, which I have the management of here, to run upon a railway of cast iron. The wheels are of cast iron, but have *wrought* iron arms, in the form and manner following:



In giving this curved form to the arms, I did not at the time contemplate that they should act as springs; though, as will be presently seen, it has been attended with great advantage. The ordinary weight of these waggons, when full of coal, is about 3 tons 15 cwt., waggon included. On this same railroad, an iron company have the privilege of conveying their iron ore, the waggons employed for which purpose are entirely of cast iron, with straight arms, and, when loaded, weigh (waggon included) something less than 3 tons. In the course of last summer, I found it necessary to repair a wooden bridge of considerable extent, over which both kinds of waggons had to pass, during the time these repairs were going on. To the great surprise of the workmen, they found that our own waggons, although the heavier, as above stated, produced less effect on the bridge than the others. This I could only attribute to the difference in the form of the arms of the wheels; and every observation which I have since made serves to confirm me in this conclusion. I have rode alternately on both sorts of waggons, when at their greatest speed, and certainly a sensible difference is felt to the advantage of the crooked and slender arms. The noise also which they make is much less. It may be proper to add, that the wheels with the wrought iron arms stand their work uncommonly well—much more so than the others. The fact is, we have not had one broken or worn out during the five years that they have been in constant use.

Should this article have the effect of turning the attention of some of your ingenious readers to the subject, it might be of service. Our wrought iron arms are 5 inches wide, and scarcely $\frac{3}{8}$ of an inch thick. Supposing, then, that, instead of being of wrought iron, they were made of steel of suitable quality, they might be made thinner than $\frac{3}{8}$, and with a greater number of arms: a much better form of curve, too, than that I have employed may very possibly be suggested.

I am, sir, yours, respectfully,

WM. BROUGH, Mineral Surveyor.

Cwmneath, Glamorganshire, Dec. 15, 1833.

WONDERS OF SCIENCE.

[Natural size of the Drop.]

MICROSCOPIC VIEW OF A DROP OF WATER.—It is not certainly known when or by whom the microscope was invented. On the one hand, we are told that one Drebell, a Dutchman, had the first microscope in the year 1621, and that he was reported to have been the inventor of the instrument. On the other hand, the invention is claimed by Francis Fontana, a Neapolitan, in 1646, who dates it from the year 1618. Thus far, however, appears to have been distinctly ascertained, that they were first used in Germany about the year 1621. The telescope is generally believed to have been invented in the year 1590; and, as a microscope is only a telescope inverted, the invention of the one may be readily believed to have originated in the use of the other.

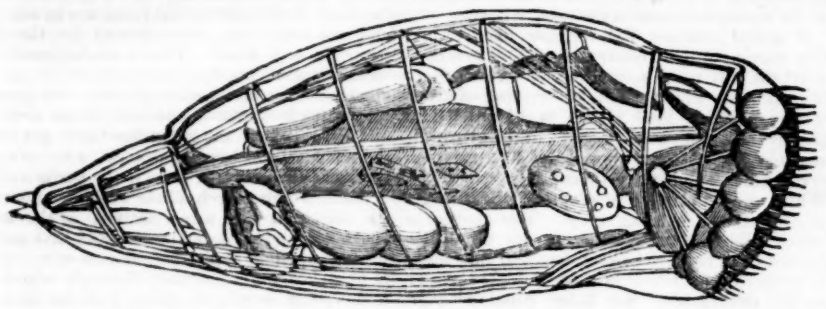
It may, perhaps, be matter of doubt which of these instruments has introduced the most wonderful facts to our notice. If the telescope has brought us acquainted with vast bodies which we had not previously conceived to exist, and thus unmeasurably extended our conceptions of the vastness of the universe, and the power of its Creator, it is no less true that the microscope, though, perhaps, with less imposing pretensions, has laid open to us most unexpected revelations of the wisdom, the power, and the providence of the Almighty, by discovering to us innumerable orders of living beings, endowed with numerous capacities, and provided with ample means of enjoyment.

An example which partially illustrates this last remark is supplied in the engraving prefixed to this article, which represents a single drop of water as it appears through a microscope, peopled with various species of minute animals called *animalcules*, of the habits of some of which we purpose to give a brief account. It may be observed in general of the microscopic orders of animals, that the smallest which have ever come under notice have been discovered in water. Not that we may infer from this that there are not creatures of equally diminutive size inhabiting the air, or creeping upon the earth; the reason is simply that, from the transparency of water, and from its confining the creatures in it, we can more easily bring the assistance of the microscope to bear on the examination of them. Of these, indeed of all animated beings, the *monas* is the most simple. The termo is the most minute creature of this genus, being so extremely delicate and transparent as often to elude the highest magnifying powers, and seeming to blend with the water in which it swims. Another and very minute class of animalcules is that which has been termed by Mr. Baker the hair-like insect, on account of its shape, being extremely slender, and frequently a hundred and fifty times as long as it is broad. These creatures are so small, that millions of millions of them might be contained in the space of a square inch. Yet low in the scale of being as they may appear to stand, owing both to their extreme minuteness and the simplicity of their structure, even these

in common with those orders of inferior animals with which we are more ordinarily conversant, exhibit indications of sagacity, and of the formation of habits. They seem, for example, to be fond of society; for, after viewing for some time a quantity of them taken up at random, the observer will see them disposing themselves in a kind of regular order. If a multitude of them are put into a jar of water, they will form themselves into a regular body, and ascend slowly to the top. When they are weary of this situation, they form themselves into a kind of rope, which slowly descends as low as they intend; but if they happen to be near the side of the jar they will descend upon it. In one experiment, a small quantity of matter containing these animalcules having been put into a jar of water, it so happened that one part went down immediately to the bottom while the other continued floating at the top. When things had remained for some time in this condition, each of these swarms of animalcules began to grow weary of its situation, and appeared disposed to change it. Both armies, therefore, set out at the same time, the one proceeding upwards and the other downwards, so that after some hours' journey they met in the middle. A desire of knowing how they would behave on this occasion engaged the observer to watch them carefully, and to his surprize he saw the army that was marching upwards open to the right and left to make room for those that were descending. Thus, without confusion or intermixture, each held on its way; the army that was going up marching in two columns to the top, and the other descending in one column to the bottom, as if each had been under the direction of intelligent leaders.

Another very singular animal, whose existence and habits have been discovered by the microscope, has been dignified with the name of the *Proteus*, from its assuming so great a variety of shapes as scarcely to be recognized as the same animal in its different transformations. Its general shape bears a considerable resemblance to that of the swan, and its changes are chiefly effected by its neck, which it sometimes extends to a considerable length, and sometimes disposes of it altogether. It also appears to have the power of increasing its transparency or opaqueness at will. There are no eyes, nor any opening in the head like a mouth, to be discerned; but its actions clearly prove that it possesses the faculty of vision, for though multitudes of other animalcules swim about with it in the same water, and its own progressive motion is very swift, yet it never strikes against any of them, but directs its course between them with astonishing dexterity.

Another and a very perfect animal is discovered by the microscope in rain water, which has stood for some days in leaden gutters, or hollows on the tops of houses. This is called the vorticella, or wheel animal. The following is a representation of it, magnified by the microscope one hundred



and forty-four thousand four hundred times. Its most remarkable distinction is the apparatus from which it derives its name, and which, from all descriptions, would appear strongly to resemble the paddles of a steamboat. They change their shape considerably in different views, but it seems pretty evident that they are circular wheels, which perform entire revolutions, and are provided with cogs similar to those on the balance-wheel of a watch. All the actions of this creature, says an observer, indicate sagacity and quickness of sensation. At the least touch or motion in the water, they instantly draw in their wheels; and it is conjectured, that the eyes of this creature are placed somewhere about this apparatus, as, while in the maggot state, its motions are slow and blundering, but after the wheels are protruded, they are performed with great regularity, swiftness, and steadiness. It is by these rotatory organs, also, that they are supposed to breathe.

Some very important discoveries have lately been made by Ehrenberg in his observations on these singular beings. By feeding infusoria with very pure colored substances, as indigo and carmine, he has ascertained the existence of mouths, stomachs, and intestines, and many interesting particulars relating to their structure and functions. But perhaps the most astonishing view of these animals, and of the wonders of the microscopic world in general, is presented by a recent improvement in the solar microscope—we refer to Mr. Gould's instrument, constructed under the direction of Mr. Cooper, and Mr. Carey, the optician,—the extraordinary effect of which is daily exhibited at No. 287 Strand. It acts on the general principle of the solar microscope, but is supplied with an artificial and most brilliant light, produced by the mixture of hydrogen and oxygen gases on lime. The writer had recently an opportunity of witnessing the effect of this extraordinary instrument, and, without describing in detail the beauties of the horrors which it brought to light from the invisible world, (in doing which he would be obliged to draw very largely on the faith of his readers,) he may give some general idea of the spectacle, by stating that the instrument magnifies *three hundred thousand times*, so that a drop of water appears to cover a surface of *a hundred square feet!*

We cannot but anticipate some important accessions to physical science from this extraordinary instrument, and we confidently recommend it to the notice of our readers as a source of much instruction and amusement.—[The Tourist.]

Damascus Steel.—The steel of which the beautiful sword blades of Damascus are manufactured has hitherto baffled all attempts at imitation. It is generally supposed to be made of slips or thin rods of iron and steel, bound together by iron wire, and then melted together by heat. The most skilful workmen of other countries have attempted to imitate this process, but in vain: so that there is reason to think that the secret of the manufacture has not yet transpired. The color of the Damascus blades is a dull bluish gray, and scarcely exceeds in hardness common steel from the forge. It is difficult to bend, and when bent does not resume its shape; the principal character, however, is its *water*, or a peculiar wavy appearance running from the hilt to the point in narrow lines, the thickness of a harpsichord wire, which never cross each other. These waving lines arise from a slight difference in the degree of polish occasioned by the unequal action of acid upon the steel; any weak acid would produce this effect, but at Damascus sulphate of alumine is the substance used. This appearance of waving lines has been imitated by a false damasking, or etching, but the genuine Damascus blade is distinguished from the false one by the obliteration of the lines in grinding, which takes place in the latter. In the real Damascus blades, grinding nearly removes the water, but it immediately re-appears by rubbing the blades with lemon juice.

To take an Insect from the Ear.—*Valuable Hint.*—Dr. Comstock, of Lebanon, Ct., has furnished, through the Boston Medical Journal, an interesting article on the mode of extracting an insect or other annoying substance which may, by accident, have been introduced into the ear. The mode is simply to dip the feather end of a goose-quill into honey, introduce it into the ear, turn it gently in the passage and withdraw it. The substance, whatever it may be, is attached to the feather by the adhesive power of the honey, and is thus extracted without danger or pain.

Plants.—Plants with few and small leaves depend chiefly on the soil. Those with many and large ones more on the atmosphere. But some can find nutriment and grow even from animals. Thus cryptogamic plants have been found vegetating on living wasps in the West Indies. This curious fact has been also noticed elsewhere. They will even grow in the stomach of living animals; for several instances of this have occurred, in which the force of vegetation has prevailed over the animal's digestive power; at least, in those who were entirely carnivorous.

Salt Water on Plants.—After an inundation of Friesland, in 1825, the oak, the mulberry, pear, and peach trees, and deep-rooted ones, did not suffer; nor the asparagus: the onions, celery, pumpkins, and some others, were never finer. But the vines and gooseberries contracted a salt taste, and the apricots, apples, cherries, poplars, elms, beech, and willows, could not stand it. They pushed out a few leaves, and then declined.—[Bull. Univ. 1829, p. 225.]

CULTIVATION OF WHEAT.—To raise good wheat is considered, both in America and Europe, as an object of prime consequence to the cultivator, and agricultural writers have of course been very voluminous on the subject. We shall select and condense some of their remarks, which appear to us of the greatest importance, and add what our own observation and experience have suggested.

Wheat is thought to be the most useful of the farinaceous plants, and as the bounty of Providence has generally decreed that those things which are most useful shall be most common, wheat will accordingly grow in almost any part of the globe. It thrives not only in temperate, but in very hot and very cold regions: in Africa and Siberia, as well as in the United States and Great Britain. It requires a good loamy soil, not too light, nor too heavy. The Memoirs of the New-York Board of Agriculture, vol. ii., p. 28, state that "wheat grows best on land which contains just as much clay as can be combined with it without subjecting the wheat to be frozen out.' And the author of that article, Mr. Amos Eaton, observes 'since it is the clay which absorbs and retains most of the water injurious in wheat soils, I adopted a rule for the consideration of farmers, founded on that principle, and confirmed by all the observations I have been enabled to make. Rule: Wash a little of the soil in a tumbler of water, and observe the time required for it to become clear. If the time required exceeds three hours, it may be considered as liable to be injured by frost.' W. Van Dusen, a farmer of Rensselaer county, N. Y., says, 'that if wheat be sowed the last week in August, on clay soil, it will generally resist the effect of frost in the winter, and of insects in the spring.' 'A clay soil,' according to the same work, 'having absorbed a large proportion of water, becomes cellular as the water freezes, or rises up in various protuberances, so that the roots of the wheat plant become disengaged from their hold in the soil. It is very manifest that if wheat be sowed so early that each plant may have time to extend its roots into the soil, its chance for retaining its hold will be better.' We believe that not only clay, but lime, chalk, marl, or other calcareous substance, is necessary to bring wheat to perfection, and the grounds of our belief we shall exhibit hereafter.

The Complete Farmer says, that 'the best time for sowing wheat is about the beginning of September. But if the earth be very dry, it had better be deferred till some showers have moistened the soil. Mr. Mortimer says he has known wheat to be so mustied and spoiled by laying long in the ground before rain came, that it never came up at all. To which he adds, 'that he has seen very good crops of wheat from seeds sown in July.' We should apprehend, however, that it would be necessary to feed wheat sown so early, in order to prevent its going to seed the first year, or getting too far advanced in its growth to resist the frosts of the succeeding winter. Sowing in dry ground is generally recommended for seeds; but wheat, being liable to be smutty, is commonly prepared by steeping in brine or lime, and in consequence of the steep, vegetation commences, and if the seed in this state is placed in earth, which is and continues for any time dry, vegetation is checked by the drought, which kills or greatly injures the seed.

Early sowing requires less seed than late, because the plants have more time, and are more apt to spread, and throw out a good number of stalks. More seed is required for poor than for rich lands, and rich land early sowed requires the least of any. Bordley's Husbandry says, 'the climate and soil of America may be believed to differ greatly from those of England respecting the growth of some particular plants. Wheat sown there two or three bushels on an acre yields great crops. Two bushels an acre, sown in Maryland or Pennsylvania, would yield straw without grain. In Maryland three pecks are commonly sown. I never had better crops than from half a bushel of seed wheat to an acre, in a few instances. In these instances the ground was perfectly clean and fine, after many ploughings or horse-hoeings of maize, [Indian corn,] on which the wheat was sown in September, while the maize was ripening. It was a clay loam highly pulverized. But because of the loss of plants at other times, I preferred to sow three pecks an acre.' 'Grain, which is thin sown,' says the Complete Farmer, 'is less apt to lodge. Every one must have observed that in places where foot-paths are made through wheat fields, by the side of the paths, where the corn is thin, and has been trodden down in winter and spring, the plants have stood erect, when most of the corn in the same field has been laid flat on the ground, an advantage proceeding from the circumstance of the stalks having more room.'

The Farmer's Assistant asserts, that 'the time for sowing wheat probably depends much on previous habit. Thus if it were sown a number of successive years by the middle of August, and then the time of sowing were changed at once, to October, the crop would probably be much lighter on that account; yet, where wheat has become habituated to be sown late, it will do tolerably well. The later it is sown, however, the more seed is requisite. When early sown, a bushel to the acre is believed to be sufficient; but when sown later, a bushel and a half, or more, may be necessary.' The estimate of seed, however, should be formed not so much from the capacity of any particular measure, as from the number of grains which that measure contains. The larger and fuller the seed is, the greater quantity by measure will be required; the smaller, the less quantity. Much, therefore, must be left to the discretion of the farmer, who must take into consideration the time of sowing, the quality and preparation of the soil, as well as the plumpness or the shrivelled state of the seed wheat.

If naked summer fallows are used at all, they may as well be made preparatory to a crop of wheat. It may sometimes be expedient to suspend, for one season, the raising of crops of any sort on land which is exhausted or greatly infested with weeds; and during the summer and autumn plough and harrow it several times, and thus thoroughly subdue it. When such a process is adopted. wheat is generally the succeeding crop. The custom of naked fallowing, however, is not much approved of in modern husbandry, and that mode of preparing for wheat is rarely adopted by scientific cultivators. Sir John Sinclair says, 'the raising clean, smothering, green crops, and feeding stock with them upon the land, is not only much more profitable, as far as relates to the value of the crop substituted in lieu of a fallow, but is also a more effectual method of procuring large crops of wheat, or any other crop which may succeed the green crop.' There is a disadvantage sometimes attending fallows, which we apprehend may be more detrimental in our climate than in that of Great Britain. Land which is kept in a light and pulverized state is liable to be washed away by violent rains, and the showers of our summer season are usually more plentiful, and fall with more impetuosity, than those of England, although the mean moisture is less, and there is less rain falls in the course of the year on this than the other side of the Atlantic.

In modern tillage, wheat more usually follows clover than any other crop; and Bordley's Husbandry says, 'clover is the best preparative for a crop of wheat.' In such case, English farmers, and indeed all others who *work it right*, give but one ploughing, and harrow in the seed by passing the harrow twice in a place the same way with the furrows. Mr. Bordley directs that the operations of ploughing, harrowing and sowing, should immediately follow each other. Mr. Macro, an eminent English farmer, says, 'from upwards of twenty years' experience, I am of opinion that the best way of sowing clover lands with wheat is to *plough the land* 10 *or* 14 *days before you sow it*, that the land may have time to get dry, and after rain to make it dress well. I am at a loss to account for the *wheat thriving better on lands which have been ploughed some time*, than it does on *fresh ploughed* lands, which dress as well or better; but I have *often* tried both ways on the same lands, and always found the former answer best. Mr. Bordley in attempting to account for this effect says, 'I *conjecture* that the clover plants being buried and the wheat sown at the same time, they both ferment and run into heat in the same period: the germ then shoots, and the root is extremely delicate and tender for some days; during which the buried herbage obtains its highest degree of heat; which, added to the internal heat of the germ, may, though only slightly, check, and a little injure the delicate shoots of the wheat. In sprouting barley for making malt, a little *excess of heat* in the bed, checks, and a little more totally stops, the sprouting or growth of the roots. Both modes give crops superior to what are produced on fallow. Farmers may well try both methods for determining which to prefer; that is, as well *immediate* sowing, on ploughing in the clover, as the method of sowing not till 10 or 14 days after having ploughed in the clover; suppose an half each way.'

We believe that wheat would flourish better, if it were buried deeper than it generally is in broad-cast sowing. Our opinion is founded on the following facts, relating to the physiology of the wheat plant. 'A grain of wheat, when put into the ground at the depth of three inches, undergoes the following transformations: As soon as the farinaceous matter which envelopes the frame of the young plant, contained within it, is softened into a milky state, a germ is pushed out, and, at the bottom of that germ, small roots soon follow. The roots are gathering strength, whilst the germ, by the aid of the milky fluid, is shooting upwards; and when the milk is exhausted, the roots are in activity, and are collecting nourishment for the plant from the soil itself. This is analogous to the weaning of the young of animals, which are not abandoned by the mother till they can provide for themselves; but the care of nature does not end here: when the germ has fairly got above the surface, and become a plant, *a set of upper roots* are thrown out, close to the surface of the ground, which search all the superficial parts of the soil with the same activity as the under roots search the lower parts; and that part of the germ which separates the two sets of roots is now become a channel, through which the lower roots supply the plant with the nourishment they have collected. What an admirable contrivance to secure the prosperity of the plant! Two distinct sets of roots serve, in the first place, to fix the plant firmly in the ground, and to collect nourishment from every quarter. The upper roots are appositely situated, to receive all the nourishment that comes naturally from the atmosphere, or artificially as manure to the surface; and serve the farther purpose of being the base of new stems, which are tillered up, and so greatly increase the productiveness of the plant. The excellence of the drill-system in grain may be probably perceived in this explanation; for, in broad-cast sowing, the seeds lay very near to the surface, and in this situation it is not only more exposed to accidents arising from birds, insects, and the weather, but the two sets of roots are necessarily crowded together, so as almost to become indistinct; the plant is less firm, and has fewer purveyors collecting food for it.'*

Dr. Deane† observed, that 'wheat that is sowed in autumn, a clover-ley excepted, should, instead of harrowing, be covered with a shallow furrow, and the surface left rough. It will be less in danger of being killed by the frost in winter, and less injured by drying winds in the following spring. The furrows should be left without harrowing; for the more uneven the ground is, the more the soil will be pulverized and mellowed by the frost.' But if the crop

* Mr. Featherstonhaugh's Essay on the Principles and Practice of Rural Economy.

which succeeds the wheat crop should require a smooth bottom, the land after sowing must be harrowed and should be rolled. Some husbandmen advise, when wheat is sown on a clover-ley, to plough in clover with a deep furrow, then plough in the seed wheat with a shallow furrow, and if the next crop in the rotation requires a level bottom, it will be necessary to harrow and roll the field as smooth as possible, after having ploughed in the seed.

The greatest care should be exercised with regard to the kind, quality, and preparation of seed wheat. There are many varieties of wheat, but winter wheat, in the United States, is generally distinguished by only two appellations, red wheat and white wheat, of which the latter is held in highest estimation.

In preparing your seed wheat, the first thing to be attended to is to clear it perfectly from every injurious foreign substance. 'One error here may mar our whole system, and render our skill productive of as much evil as good. On poor and worn-out land, the evil of sowing a mixture of impure seed with grain or grass seed would be great—but where the ground is in high order, the crop is more injured; the noxious plants take firmer hold, and are more difficult to be eradicated.' Indeed, it would be better for a farmer to pick over his seed wheat by single handfuls, and make a riddle of his fingers, than to sow cockle, darnel, tares, wild turnip seeds, and other vegetable nuisances, which are as intrusive as unwelcome, as tenacious of life as they are unworthy of existence. The first preparation therefore should be to screen, winnow, and riddle the grain till perfectly freed from these and other improper ingredients. When this is thoroughly accomplished, washing and steeping, for the purpose of preventing smut, should meet attention. The first step in the processes to be instituted against smut, as recommended by Sir John Sinclair, is 'to run the grain *very gently* through a riddle, when not only the smut balls, but the imperfect grains, and the seeds of weeds, will float, and may be skimmed off at pleasure.' The same author enumerates as modes by which smut may be prevented, 1. The use of pure cold water and lime. 2. Boiling water and lime. 3. Water impregnated with salt. 4. Urine pickle. 5. Ley of wood ashes. 6. A solution of arsenic. 7. A solution of blue vitriol. It seems that almost any acrid, corrosive, or poisonous application, will secure a clean crop, if properly used for that purpose.

Mr. Arthur Young sowed fourteen beds with the same wheat seed, which was black with smut. The first bed was sown with this wheat without washing, and had 377 smutty kernels. A bed sowed with seed, washed in clean water, produced 325 smutty kernels; washed in lime water, 43 ditto; washed in a ley of wood ashes, 31 ditto; washed in arsenic and salt mixture, 28 ditto; steeped in lime-water four hours, 2 ditto; steeped in ley four hours, 3 ditto; steeped in arsenic four hours, 1 do. Again, that which was steeped in ley, as before mentioned, twelve hours, had none; and that which was steeped in the same kind of ley twenty-four hours, had none; that also which was steeped twenty-four in lime water, had none; that steeped in arsenic twenty-four hours, had 5.

A correspondent of the New-England Farmer, (who is, we believe, a practical and scientific agriculturist, and whose statements are worthy of implicit confidence,) with the signature "Berkshire," in giving directions for preparing seed-wheat, observes, 'the only successful course is to prepare the seed about ten days before sowing time. This is done by selecting clean and plump seed, passing it through water in a tub, about half a bushel at a time, and washing it, and skimming off the matter that floats; then empty it into a basket to drain, then lay it on a clean floor and rake in two quarts of slacked lime and one quart of plaster to the bushel; and if too dry, sprinkle on water and continue to stir it until all is covered with the lime and plaster. In this way you may proceed until you have prepared your whole seed. Let it remain in a heap one day, then spread it and move it daily, until it becomes perfectly dry; it is then fit to sow, and you may sow it if the land should happen to be quite wet.'

We shall now speak of the liability of wheat to become winter killed. The author of Letters of Agricola states, as an objection to the cultivation of wheat in Nova Scotia, 'its liability to be thrown out in the spring, and thus subjecting the farmer to serious inconveniences, and often disappointment of a crop. Grasses are not exempt from the same hazard; and the hopes of the year are thus blasted by a cause, which, in many cases, will admit of remedy—in all, of alleviation. I am not sure, but sowing the wheat seed under furrow, at least four or five inches deep in September, in order that it may extend its roots and take a firm hold of the soil before the approach of winter, and rolling it in the spring with the box heavily loaded, would obviate the evils of our climate, and enable us to cultivate that grain according to the improved modes of England. It ought to be recollected that even there, about sixty years ago, winter wheat was not of general cultivation, and the heaving of the soil was accounted a powerful obstacle to its success. In Scotland, too, during the same period, spring wheat almost universally prevailed; and her northern and bleak position was thought to be incapable of any change to the better, and utterly unfriendly to autumnal semination. The zeal and industry of British farmers, combined with their skill, have baffled all these gloomy predictions, and taught us at once to copy the examples of our sires, and not to despair in the race of improvement.'

A method, according to the same author, made use of in Norfolk, England, to guard wheat against the changes and inclemency of winter and spring, is to adopt the following rotation. 'After a turnip crop, they sow barley the second year with clover seeds; the third year they cut hay, and plough down the ley, and sow their winter wheat on the matted sod. The roots of the grass bind the soil, and prevent it from heaving, which is much akin to the same effect produced by the tangled and bound surface of our new and cleared lands.' This fact may suggest another inducement to sow wheat next in rotation after clover, as has been recommended.

It is well known that our lands, where the soil is at all suitable, will produce good crops of wheat when first cleared from their native growth of wood; but after having been tilled for some years, they generally yield wheat with difficulty, and it is often found impossible to raise it by any of the modes commonly adopted for wheat culture. In most parts of Massachusetts, and in some parts of New Hampshire and Vermont, the farmers scarcely ever attempt to raise wheat, and still more rarely succeed when they do attempt it. Yet, we believe wheat was a common and profitable crop in those places in the early period of their settlement. In process of time, however, the land became exhausted of its wheat-bearing faculty, and our farmers were forced nearly to forego its cultivation. The same variations and appearances have likewise been observed in Europe. Wheat countries, by continued cultivation, have become almost incapable of yielding wheat. The cause and remedy of this partial barrenness, this falling off, with regard to particular plants, was alike involved in obscurity, till modern discoveries in chemistry threw light on the subject. It has been found that the texture of every soil is defective unless there is a mixture of three kinds of earth, viz., clay, sand, and *lime*—and that lime, in some of its combinations, exists in wheat, both in the straw and kernel. In some soils, fertile in other respects, lime may either have no existence, or be found in very minute portions, and be soon exhausted. If lime be a necessary constituent of wheat, and is not in the soil where we attempt to raise wheat, it must be supplied by art, or wheat will not grow. Or if native lime exists in the soil, in small quantities, the land may bear wheat till the lime is exhausted, and then become incapable of producing that plant, till a fresh supply of lime, marle, pulverized bones, or some other calcareous substance, is added. Mr. Young says, (Letters of Agricola, p. 299,) 'it cannot be denied, that since the plentiful use of lime has been adopted, lands in Europe will produce wheat which otherwise were incapable of bearing,' and quotes several instances in proof of this assertion. Dr. Anderson likewise gives an account of a field, which had a top-dressing of lime for the purpose of raising wheat, but the lime, by accident, was not applied to a small patch of the field, and in that patch there was no crop, while every part of the field to which the lime was applied produced wheat luxuriantly. It would be easy to adduce many more instances to prove that lime, in Great Britain, is considered not only useful, but indispensable for the production of wheat. A British farmer, we believe, rarely undertakes to raise wheat *without* the use of lime, and an American farmer as rarely undertakes to raise it *with* the use of that substance for manure.

If the foregoing premises are correct, it would seem not impossible, and indeed scarcely improbable, that by the judicious use of lime, or other calcareous substances, wheat may be as well raised in New England as in the Western States. The subject is certainly of very great importance, and deserves repeated experiments.

The remedies against rust, or mildew, according to Sir John Sinclair, are as follows:

1. Cultivating hardy sorts of wheat.
2. Early sowing.
3. Raising early varieties.
4. Thick sowing.
5. Changes of seed.
6. Consolidating the soil.
7. Using saline manures.
8. Improving the course of crops; and
9. Extirpating all plants that are receptacles of rust.
10. Protecting the wheat plants by rye, tares, and other crops. The above remedies are enlarged upon by Sir John Sinclair, in "The Code of Agriculture," but his observations are too voluminous to quote at large in this place.

[The Complete Farmer.]

To Destroy the Canada Thistle.—The following, from, we believe, the N. E. Farmer, suggests the idea of using Capt. Woodside's revolving harrow to destroy this weed.

As the season has now arrived, when most people are commencing breaking up their gardens, I take the liberty to trouble you with a few lines on the subject of the Canada Thistle, and the method I adopted to extinguish them from my garden. Some years since I purchased a piece of land in this town, and erected my dwelling-house on the north side of the road, and about four rods distant therefrom, intending to have my garden for my vegetables in front of my house, and between that and my house. But after I had broke up the ground and planted it with potatoes, I found I had selected my garden spot completely in a bed of thistles. The more the ground was stirred, the more the thistles increased. I was very loath to be disappointed in improving that same ground as my garden spot. A thought occurred to my mind that by having the ground well dug up and broke to pieces very fine, with a long tyned fork, the roots of the thistles might be extracted from the earth, so as to leave but very few in the ground. Accordingly, the next spring, I procured a fork made with four tynes, about ten inches long, and the fork about one foot wide. With this instrument I commenced digging up my garden, and as I dug up the ground, I pulverized the lamps, and left the roots of the thistles on the top of the ground, where in a very short time they began to wilt, and I had no further trouble with them. Thus, by this mode of process yearly, I have entirely eradicated them from my garden.

North Dixmont.

North Dixmont, April 23, 1834.

SUMMER WIND.

By William C. Bryant.

It is a sultry day; the sun has drunk
The dew that lay upon the morning grass;
There is no rustling in the lofty elm
That canopies my dwelling—and its shade
Scarce cools a man! All is silent save the faint
And interrupted murmurs of the bee,
Settling on the thick flowers, and then again
Instantly on the wing. The plants around
Feel the too potent fervors—the tall maize
Rolls up its long green leaves; the clover droops
Its tender foliage, and declines its blooms.
But far in the fierce sunshine tower the hills,
With all their growth of woods, silent and stern;
As if the scorching heat and dazzling light
Were but an element they loved. Bright clouds—
Motionless pillars of the brazen heaven—
Their bases on the mountains—their white tops
Shining in the far ether—fire the air
With a reflected radiance, and make turn
The gazer's eye away. For me, I lie
Languidly in the shade, where the thick turf,
Yet virgin from the kisses of the sun,
Retains some freshness; and I woo the wind
That still delays its coming. Why so slow,
Gentle and voluble spirit of the air?
Oh, come and breathe upon the fainting earth
Coolness and life. Is it that in his caves
He hears me? See, on yonder woody ridge,
The pine is bending his proud top; and now
Among the nearer groves, chesnut and oak
Are tossing their green boughs about. He comes!
Lo where the grassy meadow runs in waves!
The deep distrustful silence of the scene
Breaks up with mingling of unnumbered sounds
And universal motion. He is come
Shaking a shower of blossoms from the shrubs
And bearing on their fragrance; and he brings
Music of birds, and rustling of young boughs,
All sound of swaying branches and the voice
Of distant waterfalls. All green herbs
Are stirring in his breath; a thousand flowers
By the road side and borders of the brook
Nod gaily to each other: glossy leaves
Are twinkling in the sun, as if the dew
Were on them yet: and silver waters break
Into small waves, and sparkle as he comes.

SCOTLAND.—HISTORICAL MEMORANDA.—No country has made more progress in agricultural improvement, and in multiplying the comforts of life, than Scotland during the last fifty years. The Rev. C. Peebles, in his statistical account of Mains, in Angus, draws a curious comparison between the farmers in 1760, when he came among them, and 1790. The following are a few points:

1760.	1790.
Land ploughed with oxen. Only a few horses kept to draw the harrow in seed time, and bring in the corn in harvest. 7*l.* thought a great price for a horse.	Oxen not employed in agriculture. Farmers have their saddle horses, worth from 21 to 30*l.*, and work horses from 20 to 25*l.* each.
Land rented for 6*s.* per acre, and only two small farms enclosed.	Land at 30*s.* and all enclosed with dykes and thorn hedges.
No English cloth worn but by the minister and a Quaker.	There are few who do not wear English cloth, and several the best superfine.
Men's stockings were what were called plaiding hose, made of woolen cloth. The women wore coarse plaids. Not a cloak or a bonnet was worn by any woman in the whole parish.	Cotton and thread stockings are worn by both sexes, masters and servants. The women who wear plaids have them fine and faced with silk. Silk plaids, cloaks and bonnets, are very numerous.
Only two hats in the parish. The men wore cloth bonnets.	Few bonnets are worn, and the bonnet-maker's trade is given up.
There was only one eight-day clock in the parish, six watches, and one tea-kettle.	Thirty clocks, one hundred watches, and above sixty tea-kettles.
The people never visited each other except at Christmas. The entertainment was broth and beef, and the visitors sent to some ale-house for five or six pints of ale, and were merry over it without any ceremony.	People visit each other often. Six or seven dishes are set on the table differently dressed. After dinner a bowl of rum punch or whiskey toddy is drank,—then tea, then another bowl, then supper, and, after that, the grace drink.

IMPORTANCE OF PERSEVERANCE. — "The great art to learn much," says Locke, "is to undertake a little at a time." Dr. Johnson has very forcibly observed that "all the performances of human art, at which we look with praise or wonder, are instances of the resistless force of perseverance; it is by this that the quarry becomes a pyramid, and that distant countries are united by canals. If a man were to compare the effect of a single stroke of the pick-axe, or of one impression of a spade, with the general design and last result, he would be overwhelmed with a sense of their disproportion; yet those petty operations, incessantly continued, in time surmount the greatest difficulties; and mountains are levelled and oceans bounded by the slender force of human beings. It is therefore of the utmost importance that those who have any intention of deviating from the beaten roads of life, and acquiring a reputation superior to names hourly swept away by time among the refuse of fame, should add to their reason and their spirit *the power of persisting in their purposes*; acquire the art of sapping what they cannot batter, and the habit of vanquishing obstinate resistance by obstinate attacks."

AN EIGHTY FEET MAGNOLIA.—Those who are fond of flowers are advised to read the following article from Mobile: "This is the land of flowers, and moonlight evenings, and soft southern breezes. Here we have flowers in every variety, from the little picaroon rose to the lofty and most magnificent magnolia. The magnolia is an evergreen, rising to the height of eighty feet, and often much more. The leaves are the deepest green, and so full that the branches are scarcely to be seen. Its blossom is of pure white, five or six inches in diameter, and of delicious fragrance. This magnificent tree grows in great abundance in the wood adjoining Mobile, together with the titi, the cucumber tree, which is a species of magnolia, bearing still larger flowers, the accacia, and many others."

A PARASITE TREE.—I have recently, on a visit to Mr. Gee's plantation, three miles south of Quincy, Gadsden county, in this territory, observed a natural curiosity, the following description of which may be interesting to you and many of the readers of the American Journal of Arts and Science: It is a yellow pine tree bearing another in a perfectly healthful and flourishing state, like itself and those in the woods around them. The trees, as represented in this sketch, are united about thirty-five feet from the ground, where they entwine around each other. The one that is borne extends down to within about two feet of the ground, and is alive and healthful to its lowest extremity. These trees have been in the condition in which they now are for a period longer back than the first settlement of the country by the present population. They were pointed out by the Indians as a curiosity to the first Americans who came to Florida. The stump of the tree which is borne has long since disappeared, and the place which it occupied is now grown up in small bushes of grass.—[Letter in Silliman's Journal.]

ADVANTAGE OF BOTANY.—But my friends cares were not confined alone to the encouragement of happy thoughts in his own mind, or in the minds of others: he was always occupied in some useful deed. One of his constant engagements was spreading through different parts of the world, flowers, fruits, plants, and trees unknown before. He introduced into this country the sultana raisin from Turkey; and of rarer fruits, the hothouses of his friends were crowded with specimens collected by his care. When he had ascertained the habits of any useful vegetable, great was the ardor with which he sought to spread the knowledge of it in the places where it was likely to prosper. In this way it would not be easy to calculate how much he added to human enjoyment, nor the debt that future generations will owe to his kind concern for his race. He preferred botany to all the other departments of natural philosophy, because its pleasures could not be made so diffusive; and he valued plants as he valued men—in proportion to their usefulness. "You cannot," he would say, "multiply minerals, nor insects, nor animals at will; you cannot communicate to others this species of your riches without self deprivation; but of most vegetable productions you can easily increase the number: you can enrich others without impoverishing yourself."—[Bowring's Minor Morals.]

A UTILITARIAN IN THE FIELDS.—He talked to his boys of the beauties of nature that surrounded them, and showed them in what a wonderful variety of ways beauty is a source of pleasure. He bade them listen to the songs of the birds, to the fall of the waters, to the thousand sounds of the earth and air,—teaching them how each added something to the great account of living happiness. When the wind blew in their faces, or the sun shone on their foreheads, or the frost bit the ends of their fingers, he told them how each administered to man's enjoyment. If the air was fragrant with the flowers of spring, or the sweet hay of summer, he explained to them how the organs of smell were made subservient to the same great end; and as they looked upon the different tribes of busy creatures partaking of the various food presented to them by their Maker's munificence, he pointed out how numerous their pleasures; how marvellously provided for, how infinitely spread. "See," said he, "the great purpose of Providence; the general lesson of creation—happiness." And the thought again came over Arthur's mind, that anger never made any body the happier.—[Dr. Bowring's Minor Morals.]

VEGETABLE EXISTENCE.—If we review every region of the globe, from the scorching sands of the equator to the icy realms of the poles, or from the lofty mountain summits to the dark abysses of the deep; if we penetrate into the shades of the forest, or into the caverns and secret recesses of the earth; nay, if we take up the minutest portion of stagnant water, we still meet with life in some new and unexpected form, yet ever adapted to the circumstances of its situation. The vegetable world is no less prolific in wonders than the animal. Here, also, we are lost in admiration at the never-ending variety of forms successively displayed to view in the innumerable species which compose this kingdom of nature, and at the energy of that vegetative power which, amidst such great differences of situation, sustains the modified life of each individual plant, and which continues its species in endless perpetuity. It is well known that, in all places where vegetation has been established, the gems are so intermingled with the soil that whenever the earth is turned up, even from considerable depths, and exposed to the air, plants are soon observed to spring, as if they had been recently sown, in consequence of the germination of seeds which had remained latent and inactive during the lapse of perhaps many centuries. Islands formed by coral reefs, which have risen above the level of the sea, be ome, in a short time, covered with verdure. From the materials of the most sterile rock, and even from the yet recent cinders and lava of the volcano, nature prepares the way for vegetable existence. The slightest crevice or inequality is sufficient to arrest the invisible germs that are always floating in the air, and affords the means of sustenance to diminutive races of lichens and mosses. These soon overspread the surfaces, and are followed, in the course of a few years, by successive tribes of plants of gradually increasing size and strength; till at length the island, or other favored spot, is converted into a natural and luxuriant garden, of which the productions, rising from grasses to shrubs and trees, present all the varieties of the fertile meadow, the tangled thicket, and the widely spreading forest. Even in the desert plains of the torrid zone, the eye of the traveller is often refreshed by the appearance of a few hardy plants, which find sufficient materials for their growth in these arid regions; and in the realms of perpetual snows which surround the poles, the navigator is occasionally startled at the prospect of fields of a wide expanse of microscopic vegetation.—[Dr. Roget's Bridgewater Treatise.]

A DUTCH LANDSCAPE.—Towards evening we entered the dominions of the United Provinces, and had all their glory of canals, treck-schuyts, and windmills, before us. The minute neatness of the villages, their red roofs, and the lively green of the willows which shade them, corresponded with the ideas I had formed of Chinese prospects; a resemblance which was not diminished upon viewing on every side the level scenery of enamelled meadows, with stripes of clear water across them, and innumerable barges gliding busily along. Nothing could be finer than the weather; it improved each moment, as if propitious to my exotic fancies; and, at sunset, not one single cloud obscured the horizon. Several storks were parading by the water side, amongst flags and oziers; and, as far as the eye could reach, large herds of beautifully spotted cattle were enjoying the plenty of their pastures. I was perfectly in the environs of Canton, or Ning Po, till we reached Meerdyke. You know fumigations are always the current recipe in romance to break an enchantment; as soon, therefore, as I left my carriage and entered my inn, the clouds of tobacco which filled every one of its apartments dispersed my Chinese imaginations, and reduced me in an instant to Holland.—[Mr. Beckford.]

Lord Huntingtower has set out 38 gardens for the laborers of Great Ponton, and it is his intention to follow the same laudable plan upon his estates in other parishes.—[Stamford Mercury.]